THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXIX. No. 728.] LONDON, APRIL 24, 1877. [29TH YEAR.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL COAL. Analysis—12,000 cubic feet of gas per ton of coal; 28-candle gas; coke, 66·70 per cent.; volatile matters, 33·30 per cent. Coke of good quality.

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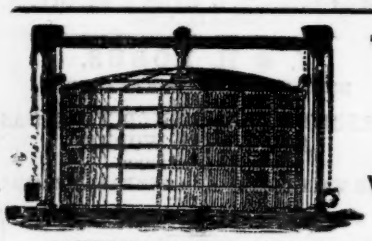

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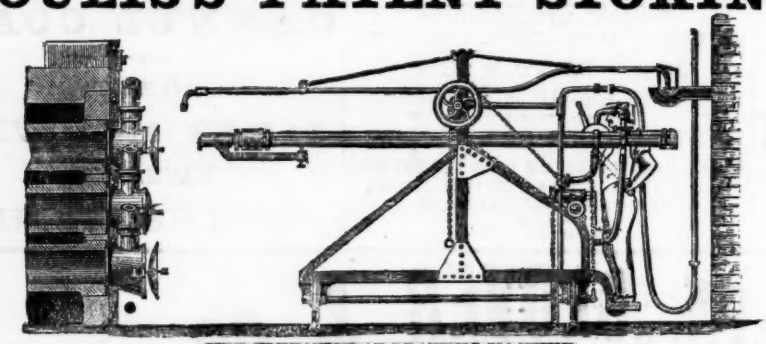
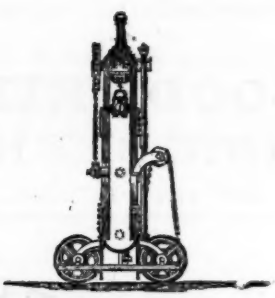


SIDE ELEVATION OF DRAWING MACHINE.



END ELEVATION.

(The Charging Machine will be Illustrated in next week's Advertisement.)

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SPECIAL NOTICE.—Our Patent Machine-made Retorts have now been in *actual work* nearly 800 days, and are yet in good order. References on application.

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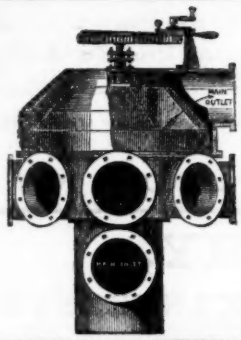
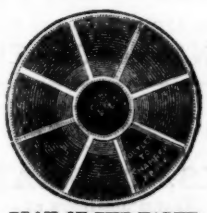
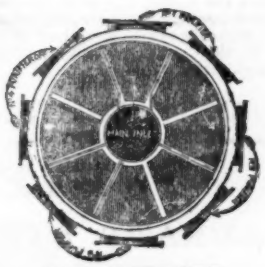


C. & W. WALKERS'
PATENT CENTRE-VALVES.





ELEVATION OF THE CENTRE-VALVE. PLAN OF THE VALVE. PLAN OF THE BODY.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers on the system of three in action, and one out of action. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A considerable improvement and saving is effected in the cost of the connecting-pipes.

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SELF-ACTING REMOVABLE DIP-PIPE,

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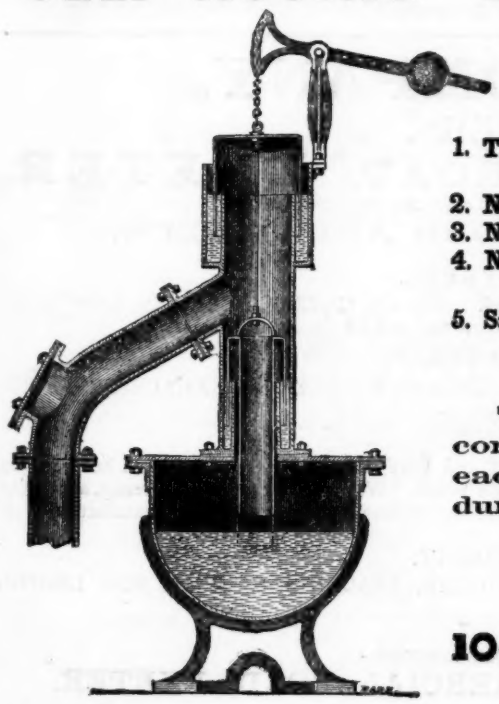

ADVANTAGES.

1. There is no pressure on the Retorts.
2. No deposit of Carbon.
3. No scurfing is required.
4. Never a choked Ascension-Pipe.
5. Saves Fuel and Wear and Tear.
6. Gets 10 per cent. more Gas out of the Coal, and a higher Illuminating Power.
7. Is never out of order.
8. Requires no attention.
9. Is perfectly automatic in its action.

These Dip-Pipes can now be supplied complete, except the flanched bend, for £4 each, which includes the charge for licence during the whole term of the patent.

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Who fix the Dip-Pipes, at a small Charge, when required.

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The Company repair or convert every description of Wet Gas-Meters to De Castro and Burton's Patent.

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OF THE

FRICTIONLESS DRY GAS-METERS,

Beg to intimate to Gas Companies and others that they are now prepared to supply these very superior Meters at the same prices as for the ordinary Gas-Meters.

In the construction of this Meter, for which the best tin plates only are used, every mechanical contrivance has been taken advantage of successfully to reduce the friction to a minimum, which is amply proved by the fact that they are made to work upon only one-fortieth of an inch pressure. By an improvement also in their construction, a steadier light is obtained, and greater capacity than can be got from any other Meter in the market. No gas can pass under the valves on any back pressure, as is the case with many other Dry Meters.

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ALL METERS ARE UPHELD FOR FIVE YEARS.

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And every Description of Gas Apparatus.

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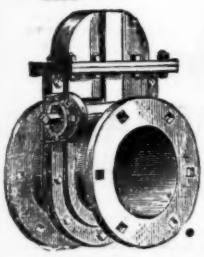
IMPROVED GAS-VALVES

WITH WROUGHT-IRON PINIONS.



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These Valves are proved on both sides to 30 lbs. on the square inch before leaving the works, and are kept in stock..

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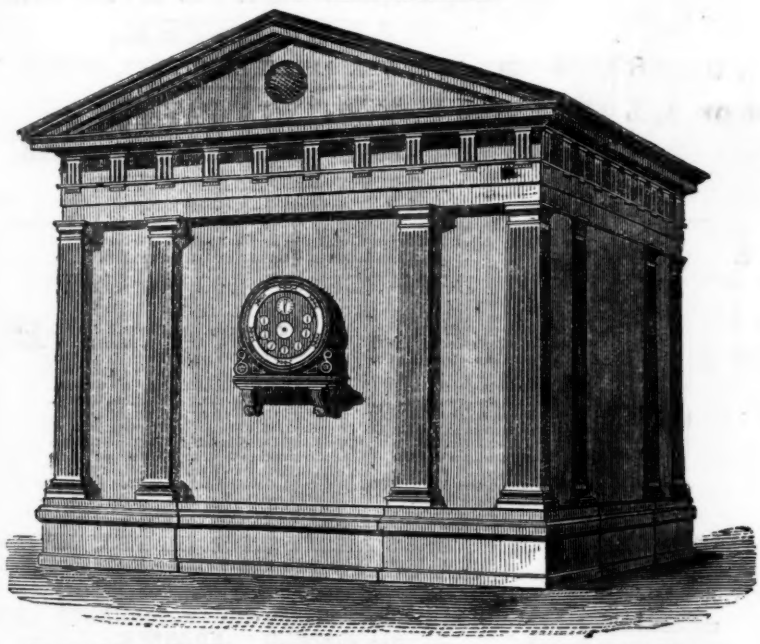

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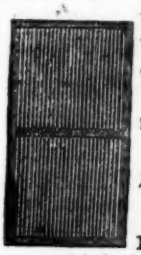

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CAPABLE OF MAKING 10,000 FEET WEEKLY.

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AMMONIACAL LIQUOR, &c.

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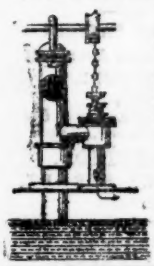

Produces from 10 to 20 per cent. more gas of higher illuminating power.
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Retorts last much longer.
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This simple invention has been in use in many works for the last six months, with the above results.

PRICE 2 GUINEAS EACH.

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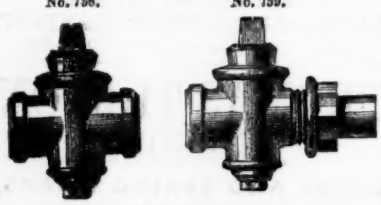
CAST-IRON GAS-MAIN COCKS,

WITH PATENT WHITE METAL PLUGS.

TRADE (L) MARK.

No. 758. No. 759.



The bodies of these Taps are made of iron, black or galvanized, and the plugs of patent metal. They are warranted not to set fast or corrode, as do Iron or Brass Cocks; will always work easily; are strong, well made, durable; of little or no intrinsic value, and therefore not likely to be stolen; and the prices as stated below are (especially upon the larger sizes) fully 50 per cent. less than Brass Cocks.

	½	¾	1	1¼	1½	2-inch.
No. 758, with inside screws for iron pipe, black	2/0	3/0	4/4	6/6	7/6	12/0 each.
No. 759, with union on one end screwed inside for iron pipe, black	2/9	3/10	5/4	8/0	9/0	15/6 each.
Nos. 758 and 759, galvanized	0/3	0/4	0/6	0/8	0/10	1/4 extra.

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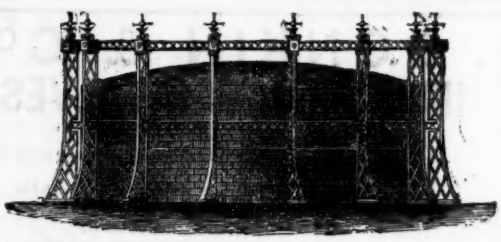
AND FOR THE

SUPPLY OF RETORTS, FIRE-BRICKS, CAST-IRON MAINS,

AND ALL MATERIALS FOR GAS MANUFACTURE AND DISTRIBUTION.



THE HORSELEY COMPANY,

LIMITED,

TIPTON, STAFFORDSHIRE.

LONDON OFFICE:

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GAS ENGINEERS, IRONFOUNDERS, &c.,

MANUFACTURERS OF

GASHOLDERS, WROUGHT AND CAST IRON TANKS, CONDENSERS, PURIFIERS, SCRUBBERS, MAINS, RETORT-LIDS, PLAIN AND DISHED, LAMP-POSTS, PIPES,

AND ALL REQUISITES FOR EITHER

GAS OR WATER WORKS;

ALSO

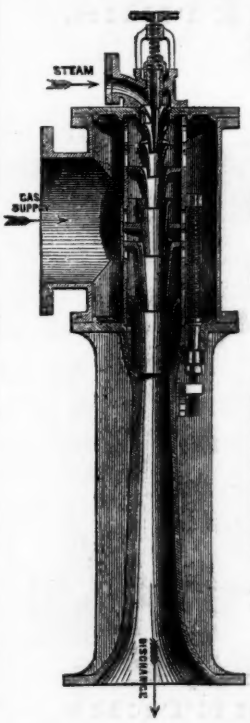
MAKERS OF ROOFS, BRIDGES, &c.

KÖRTING BROS.,

Steam-Jet Engineers,

7 and 17, LANCASTER AVENUE, MANCHESTER,

AND 40, LOWER GARDINER STREET, DUBLIN.



E. KÖRTING'S PATENT

STEAM-JET GAS-EXHAUSTER.

IMPROVED CLELAND'S PATENT.

Small Cost—Compactness—Perfectly Self-Acting—
Self-Regulating—Self-Cleansing—No Steam-Engine—No Attention—
No Extra Room Required—No Wear and Tear—No Noise—
No Oscillation in Vacuum, or Back Pressure.

UPWARDS OF 200 IN USE.

SUPPLIED TO—

Chartered Gas Co.	Glasgow Corporation.	Hanna, Donald, and Wilson, London.
London Gas Co.	Leyland Gas Co.	Ratcliff Gas-Works.
S. Metropolitan Gas Co.	Stalybridge Gas-Works.	Kendal Gas-Works.
Phœnix Gas Co.	Lincoln Gas-Works.	Longton Gas Co.
Liverpool Gas Co.	Birmingham Gas-Works.	Dartford Gas Co.
Bolton Corporation.	Wakefield Gas-Works.	Exeter Gas Co.
Horsham Gas Co.	Brentford Gas-Works.	Harrogate Gas Co.
Epsom and Ewell Gas Co.	Burnley Gas-Works.	Hertford Gas Co.
Ipswich Gas Co.	Guildford Gas-Works.	Waterside Gas-Works, Todmorden.
Cheltenham Gas Co.	Gloucester Gas-Works.	F. W. Grafton and Co., Accrington.
Sandwich Gas Co.	Kirkintilloch Gas-Wks.	
Cornholme Dis. Gas-Wks.	Nantwich Gas-Works.	
Bury Gas-Works.	Enniskillen Gas-Works.	

&c., &c., &c.

E. KÖRTING'S PATENT STEAM-JET REVIVIFYING BLOWERS FOR THE PURIFYING MATERIAL.

SOLE LICENSEES FOR

W. CLELAND'S PATENT STEAM SCRUBBER AND SLOW-SPEED CONDENSER.

FOR PARTICULARS, APPLY TO

KÖRTING BROS., 7 and 17, Lancaster Avenue, MANCHESTER, and 40, Lower Gardiner Street, Dublin,

OR TO

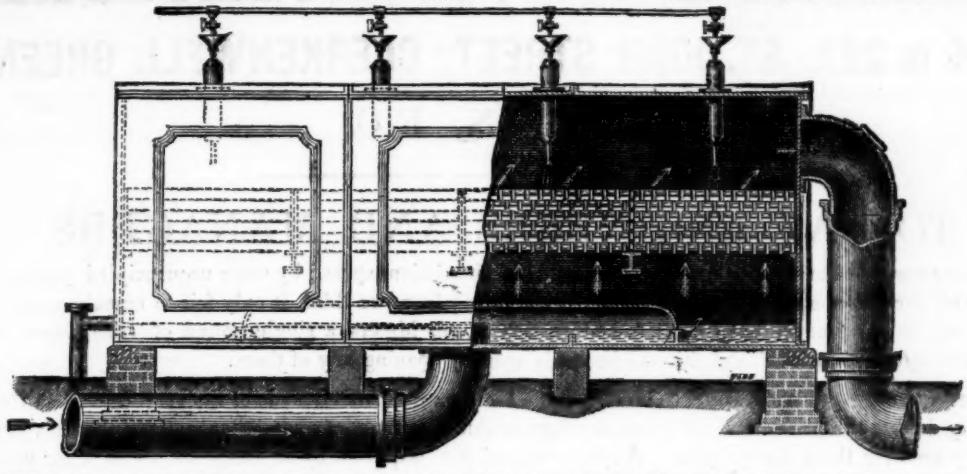
GERALD J. TUPP, 8, John Street, Adelphi, W.C., LONDON,

SOLE AGENT FOR ENGLAND AND WALES.

GAS PURIFICATION.

SAVILLE'S SELF-DISTRIBUTING GAS SCRUBBER-WASHER.

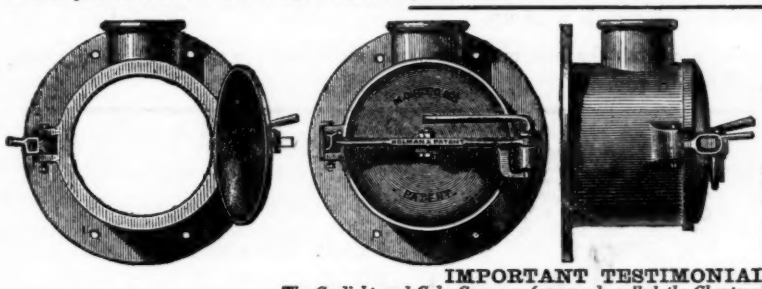
PATENTED IN GREAT BRITAIN, FRANCE, BELGIUM, PRUSSIA, AUSTRIA, & UNITED STATES.



MECHANICAL ARRANGEMENT.—The Washer Tank contains a large bottom chamber, into which the Gas is freely admitted through an ordinary full-way inlet-pipe, passing first under an inverted vessel which removes any Tar remaining in the Gas after leaving the Condenser; it then rises slowly over the whole surface, CONTAINING AN AREA OF ABOUT EIGHT TIMES THAT OF THE INLET-PIPE, through equidistant spaces in a series of Self-Sealing Water Troughs, arranged in tiers, dividing itself and passing through the various dips until it reaches the upper chamber, and from thence through the outlet-main. The washing liquid being CLEAN WATER is admitted by the Syphon inlets on top of Tank to the upper row of troughs, running through each successive tier, and becoming impregnated with the impurities extracted from the Gas, gaining strength at each dip on its descent, and finally passing off by the outlet syphon at the bottom. It will be observed that in this Scrubber-Washer the Gas comes first in contact with THE STRONGEST LIQUOR at the bottom, and passes through WEAKER LIQUOR at each successive tier, until it issues through CLEAN WATER into the upper chamber; hence the true principle of Gas Purification by Washing is simply and automatically effected.

ADVANTAGES.—Great economy in first cost and foundations; great saving of other purifying apparatus and material; occupies little space, and stands only a few feet in height; being entirely self-acting, requires no motive power either for purifying or distributing; the Gas is washed several times in ONE vessel, each time in liquor of a different strength, ultimately passing through CLEAN WATER; produces liquor of any required strength by once passing through; can be fixed (if desired) at any elevation to permit Contractors' tanks being filled without the expense of pumping.

One of these Scrubber-Washers has been in successful operation for the past twelve months at the Sowerby Bridge Gas-Works, and they are now being erected at the Corporation Gas-Works, Adderley Street, Birmingham, and at the Phœnix Gas-Works, Vauxhall, London.



MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH

HOLMAN'S NEW PATENT BRACKETED CROSS-BARS, ANTI-FRICTION CATCHES AND ECCENTRIC FASTENINGS.

Instantaneous Sealing effected. No Luting. No Duplicate Lids required. Holman's New Self-Sustaining Cross-Bar ensures freedom of joint and maintains parallel position of the Lids.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested (rigid cast iron is now successfully employed), nearly 25,000 being in use at various Gas-Works in London and the Provinces.

IMPORTANT TESTIMONIAL.

The Gaslight and Coke Company (commonly called the Chartered Gas Company), Beckton, North Woolwich, July 2, 1874.

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—In answer to your inquiry respecting the Self-Sealing Lids, I beg to say that they continue to work well, and I have every reason to be satisfied with them. I should be very sorry to return to the old system of Luting, and our stokers here freely acknowledge the benefit to them of the new system.

I am, yours truly, (Signed) G. C. TREWEY.

HUNT'S PATENT EQUILIBRIUM GAS-GOVERNOR.

In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown in the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

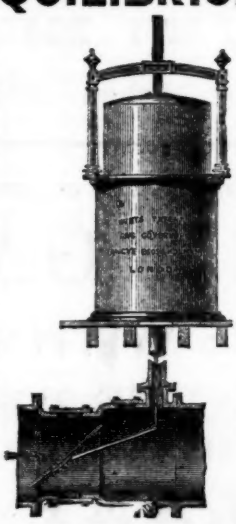
Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide-Valve direct in the main; and the holder can be placed at any convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.



These Governors have been adopted by many leading Gas Companies, among whom are the following:—

The Gaslight and Coke Co. (9), The London Gas Co. (3), and at Abergavenny, Andover, Birmingham, Cannes (France), Devonport, Dronfield, Dursley, Exeter, Guernsey, Mentone (France), Monmouth, Newcastle-on-Tyne, Oxford, Plymouth, Rochdale, Windsor, &c.

TESTIMONIAL.

The Gaslight and Coke Company,
9, Water Street, New Bridge Street,
Blackfriars, E.C., Feb. 27, 1875

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—The two 24-inch and three 36-inch Hunt's Equilibrium Governors supplied by you, and fixed in the valve-rooms at Whitechapel, Goswell Road, and Blackfriars, are working very satisfactorily.

Yours truly,

(Signed) JOHN JOHNSON.

PRICES AND FULL PARTICULARS ON APPLICATION TO

TANGYE BROTHERS & HOLMAN,

SOLE MANUFACTURERS,

LAURENCE POUNTNEY LANE, LONDON, E.C.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON, E.C.

TO GAS ENGINEERS AND MANAGERS.

It having come to our knowledge that a report is in circulation, spread by some unprincipled person or persons, that the cases of our larger-sized Meters are made of Galvanized Iron, we think it only fair to ourselves, and just to our customers, to say, that we never have used, in making any of our Meters, a single pound of *Galvanized Iron*, or any other *cheap* and *inferior material*, and this can be easily seen by opening any of them.

The cases of our large-sized Meters, from 20 lights and upwards, are all made of the very *Best Best Patent Alloy*, which is nearly double the price, and will last more than double the time, of some other material that has been and still is very largely used for the same purpose. And our experience, acquired by an extensive use of it for upwards of 30 years, enables us to say with confidence that no other metal in use for the purpose is so little liable to corrosion from the action of the gas.

We have now in use a Meter made in 1848, and therefore 29 years old, the case of which is made of Patent Alloy; the Meter is still in perfect order, and shows no signs of decay.

The utmost care is exercised by us in selecting none but the very best materials for all parts of our Meters; much of it is made *expressly for us*, as it is not possible to obtain it in the open market of the same superior quality.

The great fall in the price of all materials used in making our Meters has enabled us to give an increased discount, thus giving our customers the benefit of the fall. This we were bound in fairness to do, as we raised the price of our Meters four years ago, when the price of all metals went up.

It will be our constant endeavour, by using none but the best materials, and employing the most skilful workmen, to maintain the high character our Meter has hitherto borne.

WILLIAM PARKINSON & CO.,

(SUCCESSORS TO SAMUEL CROSLEY,)

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

MANUFACTURERS OF PATENT

WET & DRY GAS-METERS,

STATION-METERS WITH PLANED JOINTS,

GOVERNORS, PRESSURE REGISTERS, GAUGES,

AND EXPERIMENTAL APPARATUS,

STREET-LAMP METERS,

AND REGULATORS FOR AVERAGE METER INDICATION.

METERS FOR MEASURING WATER.

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TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

R. R., Hiogo, Japan.—*Your letter of the 24th of February received. It will be better to wait your return to England next year than to risk sending the "Treatise" to you in monthly parts.*

PARIS GAS COMPANY.—*The annual report of this company is in course of translation, and will appear in the* JOURNAL *shortly.*

COMMUNICATIONS RECEIVED.—*N. S.; T.; C. E. J.; C. T. Salomons, Rotterdam.*

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, APRIL 24, 1877.

Circular to Gas Companies.

BACKED by the Government, Mr. Raikes, on Friday last, succeeded in carrying his new Standing Order, but with additions which some will regard as of much importance. It will be seen that Select Committees of the House of Commons on Gas Bills are now recommended to insert auction clauses in all such Bills, unless they see fit to omit them, the reasons for such omission being reported to the House; but, together with them, the Committee *may* compel the adoption of the sliding scale by any Company promoting a Bill for new capital. A difference will be noticed in the two clauses of the new Order. The insertion of auction clauses is made imperative, so far as a Standing Order can make it so; but the adoption of the sliding scale is made permissive.

In another column we publish our own special *verbatim* report of the debate. There is but little in the discussion which calls for observation. Mr. Raikes and Sir Charles Adderley also devoted themselves to demonstrate that the proposed new Order would not contravene the provisions of any existing Act of Parliament. The former member took higher ground, and contended that Parliament had a perfect right to revise previous decisions. No one will dispute that position. Parliament once enacted that people should be hanged for shop-lifting and sheep-stealing, but subsequently, and very properly, saw fit to abolish capital punishment for such crimes. But the reversal of a commercial policy, under which millions of capital have been raised and changed hands, is a very different matter. Granted, that, as Sir Charles Adderley contended, the Companies Clauses Act of 1863 was in the nature of a permissive measure; still it is a fact, that most Gas Companies who have gone to Parliament since the date of its enactment have adopted its provisions. They have been renounced, of course, by those companies who have accepted or proposed auction clauses; but that does not affect our argument. When people get permission to do something which it is obviously to their advantage to do, they generally avail themselves of the privilege. Thus, Gas Companies adopted the Act of 1863, which allowed them to allot new shares to existing proprietors at par, and this, as we have said, has had a very important influence in fixing the price of gas property.

How far the sliding scale of dividend can be regarded as a *quid pro quo* for the abolition of the privilege conferred by the Act of 1863, we shall not stop to discuss. Much will, of course, depend on the standard price granted by a committee; but this much is certain, that the first fall of dividend under the action of the sliding scale, will create a perfect panic in the world of gas shareholders. Such an event, at the present moment, looks like a very improbable contingency; but the future is always uncertain, and another coal famine may be upon us before non-dividend bearing capital obtains such a proportion to capital entitled to profit, that dividends may be considered as perfectly safe.

Sir Charles Adderley professes to consider auction clauses as indispensable for the protection of the public, and he has so little faith in the disposition of honourable members of the House of Commons (they are all honourable), that he prefers an imperative to a permissive Standing Order.

The story told by Mr. Goldney, to show the necessity for a "Standing Order," is not a bad one in its way. The three honourable members, standing up in 1869, confessing their ignorance of resolutions adopted by the House in the previous year, would form the subject of an interesting picture, which might be fitly engraved, and hung up in every committee-room as a caution. Henceforth, however, and as regards the matter now under consideration, honourable members will be under the guidance of that very useful class of professional men, Parliamentary Agents, controlled by the Examiners of Standing Orders. They will be in leading-strings, which are, perhaps, more or less, necessary for all men.

We extract from the proceedings of the House of Commons the terms of the new Standing Order as adopted by the House:—

"Ordered, That in every Bill by which an existing Gas Company is authorized to raise additional capital, provision shall be made for the offer of such capital by public auction or tender, at the best price which can be obtained, unless the Committee on the Bill shall report that such provision ought not to be required, with the reasons on which their opinion is founded.

"In the case of every such Bill it shall be competent to the Committee so to regulate the price of the gas to be charged to consumers that any reduction of an authorized standard price shall entitle the Company to make a proportionate increase of the authorized dividend, and that any increase above the standard price shall involve a proportionate decrease of dividend.

"Ordered, That the said Order be a Standing Order of this House [to follow Standing Order 188]."

A reference to Sir Charles Adderley's speech will show that a somewhat important proviso, suggested by the Government, is not embodied in the foregoing Order. It was to the effect that, in auctions, if a proprietor bid as high as the highest bid of a non-proprietor, the former should be the purchaser. This suggestion, although, as it is seen, it is not embodied in the Order, will be a useful hint to Parliamentary Agents, who will not neglect to insert it in the auction clauses. It is a very small atonement for what we consider a very great wrong; but, in these days of confiscation, we must be thankful for very small mercies.

We do not encumber our columns with the division-list, which, nevertheless, presents some remarkable features, not the least amusing of which is seen in the fact that the Irish Home Rulers, who would confiscate every species of valuable property, helped to swell what must be regarded as the Government majority.

It remains to be seen how far the new Standing Order of the Commons will bind the House of Lords, or rather Earl Redesdale. If the noble Earl had considered auction clauses harmless to gas proprietors, and advantageous to the public, we feel certain that he, who, more than any other man, has striven to reconcile the interests of both parties, would have insisted upon them long ago.

The Blackburn Borough Gas, &c., Bill has gone down from the Lords, amended in a very particular manner. Our readers will remember that the Corporation of Blackburn proposed in a most peremptory clause to make a compulsory purchase of the

gas undertaking. The clause by which it was intended to enact that the Company, on receiving notice from the Corporation, should be required to sell, has been modified by Earl Redesdale, so that it now reads as follows:—"The Corporation and "the Gas Company may, at any time after the passing of this "Act, agree for the purchase by, and sale to, the Corporation of "the gas undertaking, for such consideration, in gross or by "annuities, and on such terms and conditions as the Gas Com- "pany and the Corporation may agree." It is thus left optional to the Company to sell or not, as they may feel disposed. Probably, if an adequate consideration be offered for an undertaking of a somewhat exceptional value, the Company will agree to sell; but we regard this amendment of Earl Redesdale as constituting a most important precedent. It says plainly to Corporations: "Get well advised, and make fair terms with a Gas Company, "but do not come here with a fishing proposal, which will pro- "bably lead to a very expensive arbitration." We hope Corporations will take the hint.

In another column will be found a report of the Surveyor of the Bermondsey Vestry, as to the steps necessary to compel the Surrey Consumers Gas Company (if compulsion be necessary) to comply with the provisions of the Metropolis Gas Act, 1860. It shows that the Vestry have put themselves hopelessly in the wrong, by neglecting to comply with the provisions of that Act, which required them to set up a testing-station and appoint an Examiner; or, as the Surveyor does not mention, join with another Vestry, like St. Olave's, in doing so, if they were economically disposed. Not having done so, they are not in a position to take any proceedings against the Gas Company, however much the latter may have failed in their duty to the public. The position of the Surrey Consumers Company is, in some respects, *unique*; they charge the highest price, and supply the lowest quality of gas in the Metropolis. This is not as it should be. After allowing sixteen years, however, to elapse without fulfilling an obvious duty, it is rather late in the day for the Bermondsey Vestry, in view of impending changes, to set up a testing-station; but surely the Gas Company might do something to allay the discontent which rages within their limits.

The Corporation of Hull appear to be making a serious effort to purchase at least two of the three undertakings which supply gas within the Corporation limits. Overtures, it seems, have been made to the Kingston, and also to the Sutton, Southcoates, and Drypool Companies, with what result we do not, as yet, know. The undertaking of the British Company is, of course, beyond the reach of the Corporation, except by a very compulsory measure; and, moreover, we doubt whether the Corporation would care to acquire it.

The Corporation of Dublin have notified to the Gas Company, through their Lighting Inspector, their desire to reduce the consumption of gas in the public lamps to three-and-a-half feet per hour. The Company very naturally protest against any alteration in the rate of consumption—first, on the private ground that it would be a violation of an agreement entered into last year, in virtue of which they reduced the price of gas to private consumers (and thereby, they might have added, saved the citizens £8000 a year); and, further, on the public ground that, even with the present consumption, the lamps are so far apart that Dublin is about the worst-lighted city in the kingdom. Three-and-a-half feet of sixteen-candle gas per hour in Dublin would, we should think, give just sufficient light to render darkness visible.

In our summary last week, and also in the list we gave of special Gas Acts containing auction clauses, we omitted to mention one of the first Acts passed with such clauses—the Bristol Gas Act, 1853, which Act united the two Companies then supplying gas in Bristol and the neighbourhood. This Act gave the United Company power to raise £80,000 of new capital, and directed that the shares, as they were issued, should, in the first instance, be offered for sale by public auction in the City of Bristol. It further enacted, that any premium paid for such shares should be applicable to the purposes of the Company, but not entitled to dividend. A letter appearing in another column, from Mr. G. W. Stevenson, which reached us after this paragraph was written, gives a still earlier instance—that of Ashton-under-Lyne, in 1847. We have heard of more than one claimant for the honour of having invented auction clauses, but the real inventor is still unknown to us.

The Town Commissioners of Mansfield are anxious to acquire the Gas and Water Works supplying the district. We do not know whether any negotiations have taken place; but we notice that the Chairman of the Commissioners values the gas-works at £45,000, and the water-works at £30,000; and he estimates that the profits of the gas-works will be sufficient to provide a sinking-fund, to pay off the £75,000 to be borrowed, in seventy years, and also to cover the inevitable loss incurred by the supply of water. Our engineers, skilled in valuing gas property, are having a busy time of it just now, and their business, we are afraid, is likely to increase.

The Corporation of Swansea, as our readers are aware, are hankering after the gas undertaking, failing the purchase of which they are desirous to set up competing works; but recent proceedings in the Town Council seem to show that the consideration of the purchase, or the installation of new works, is likely to be deferred for some time. If the Company agreed to sell, or if the Corporation obtained a compulsory Act — both very improbable contingencies — or if it should be resolved to enter into competition, it would be necessary for the Corporation to raise, by loan, a very considerable sum of money, for which the sanction of "My Lords" the Commissioners of Her Majesty's Treasury would be necessary. Fortunately, or unfortunately, the credit of the Corporation is, just now, not very good in that quarter. Some two years ago, "My Lords" sanctioned a loan of £20,000; but no return, it would appear, has ever been made of how it was expended, nor has a sinking-fund been provided. Quite recently the Corporation memorialized "My Lords" for power to borrow the modest sum of £800, the sanction for which was promptly refused, until a full, true, and particular account was furnished of the way in which the last loan had been applied, with a statement of all the existing obligations of the Corporation. The Gas Company are evidently safe from molestation for some years to come. Let us hope that a good feeling will presently be established between them and the Corporation.

The tyrannical conduct of Gas Companies is constantly denounced. Recently, in the lobby of the House of Commons, a member remarked that Gas Companies deserved no consideration, for they never showed any to their customers. They sin, however, in good company, for the following is what we see written of a Corporation supplying gas:—"Having erected a powerful "monopoly, they make it the instrument of a gigantic tyranny, "and, overriding all commercial axioms, they prefer money in "hand," &c., &c. The Corporation of Glasgow are alluded to, and the cause of this outpour of wrath is rather amusing. We had occasion to mention, some months ago, that great complaints had been made of the presence of sulphuretted hydrogen in the gas sent out from one of their stations. It was the result of accident, and the cause was speedily remedied. Among the complainants was a medical gentleman who thought fit to discontinue the use of gas in his consulting-room, and adopt, for a time, what he describes as "a moveable table-light." By-and-by the inevitable gas bill arrived, whereupon the indignant doctor indited a letter to the Gas Committee, requesting that some deduction might be made for the annoyance he had been subjected to. The answer was that he was free to burn gas or to use a moveable table-light; but, if he burnt gas, he must pay for it, and the Committee could not recognize any claim for compensation if he chose to discontinue the use of gas. A good deal more correspondence ensued; but the Gas Committee were inexorable, and it only remained for the aggrieved doctor to detail his wrongs in a lengthy communication to the *Glasgow Herald*, from which we take the expressions quoted above. Surely no Gas Company was ever better abused, and with less reason.

Water and Sanitary Notes.

LONDONERS, or rather a section of them, are just now rejoicing over the prospect of obtaining an unlimited supply of pure soft water from the lower greensand formation, which at a great depth underlies the Metropolis. We read in a contemporary that the news that the greensand had been tapped with success created a panic among the shareholders in the Metropolitan Water Companies. If it were so, nothing more absurd was ever known.

Most of the London breweries have wells sunk into the chalk under the London clay. The level of the water in these, however, slowly falls as they are pumped, and they periodically require deepening. Messrs. Meux and Co., at their brewery at the corner of Tottenham Court Road, had a well, the bottom of the bore of which was in hard grey chalk 365 feet below the surface of the ground. But it gradually gave out, and the firm determined to make the attempt—somewhat hazardous in North London—to reach the lower greensand, and they are reported to have arrived at that stratum at a depth of 1001 feet. An attempt had been made before to reach the greensand north of the river, and that was by a sinking at Kentish Town, where, at a very great depth, the borers came upon a mass of Palæozoic rock, and the attempt was abandoned. Geologists were uncertain how far this rock extended, and no encouragement was given to further

efforts. Another attempt was made at Crossness, but was abandoned at a depth of 920 feet, when 147 feet of gault had been bored through. It was stated at the last meeting of the Metropolitan Board that these operations have been renewed, and the boring carried to a depth of 976 feet, but it is yet in the gault. The matter is of some importance to the Metropolis, for if it be proved that the lower greensand is accessible at a reasonable depth around London, we shall hear no more of those extravagant schemes for bringing water from a long distance at an enormous cost.

There is no doubt that the lower greensand constitutes an enormous reservoir of water. Mr. Prestwich has estimated the subterranean area of the formation to occupy 4600 square miles; and, assuming the thickness of the stratum to be 200 feet, he calculates that we have 920,000 square miles, one foot thick; and his experiments have led him to the conclusion that each of these miles holds water sufficient for a day's supply to the Metropolis.

We might congratulate the public rather than the Messrs. Meux on the success of their enterprise, for lower greensand water is very soft, and, consequently, not well adapted for brewing purposes. It is, however, better than the water from the chalk under the London clay, which usually contains a considerable amount of carbonate of soda. We wait, with interest, for more complete details of the experiment, which, at present, has only furnished matter for somewhat sensational articles in the daily papers.

It is pleasant to see Mr. G. H. Whalley engaged in a rational, if rather a hopeless, enterprise. He is a landowner, and has a large amount of water on his property, which he distributes on very liberal terms. He is anxious to see others follow his example; but, having regard to the impecuniosity of many landowners, he has brought in a Bill to give further facilities to owners with limited interests, to charge their estates (with the sanction of the Enclosure Commissioners) with the expense of constructing reservoirs to supply Local Authorities and Water Companies. No objection, we believe, has hitherto been made to landowners constructing works for the supply of water to labourers and others resident on their estates; but we expect the extension now proposed by Mr. Whalley will encounter much opposition. Every rill that runs from one man's estate may run through that of another, who may claim a pecuniary interest in the water. Thus, this Bill, if successful, may give rise to a great amount of litigation. Mr. Whalley's object is, however, decidedly praiseworthy.

We propose next week to print Dr. Frankland's somewhat sensational report on his analyses of the waters supplied to the Metropolis during the past year, omitting the tables, which would occupy too much of our space. The Doctor continues his attacks on Thames water, which he denounces as utterly unfit for domestic use, notwithstanding the fact that it is used and drunk by over two millions of people, and has never been proved to do anybody the smallest harm. He will doubtless be rejoiced at the prospect of a supply from the greensand, although his preference is for chalk water, softened by Dr. Clark's process. Notwithstanding the stated results of his analyses, and his microscopic observations of living and moving organisms, we venture to regard the water supply of the Metropolis as eminently satisfactory, and the death-rate for the past year seems to us to confirm our opinion.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

CXXXII.

Service-Pipes.

Fig. 1.

Fig. 2. Fig. 3. Fig. 4. Fig. 5. Fig. 6. Fig. 7. Fig. 8.

Fig. 9. Fig. 10. Fig. 11. Fig. 12. Fig. 13.

All pipes, of whatever size or description, branching out from the main-pipes for the distinct supply of gas to the premises of consumers, public lamps, &c., are called service-pipes. Those for the supply of extensive works, mills, factories, large railway stations, theatres, &c., are of cast-iron, and vary in size from 3 inches diameter and upwards, whilst the great majority of service-pipes are of wrought-iron tube from 3-4ths of an inch up to 2 inches bore (fig. 1).

By the term "service-fittings" is meant the short pieces of wrought-iron pipe, equal and diminishing, either straight, as connecting-pieces, (2), ferrules (3), sockets (4), nipples (5), caps (6), plugs (7), and back-nuts (8); angular, as elbows (9), square and round bends (10), springs (11), tees (12), and crosses (13), uniform or irregular in size or diameter at their different ends, which are used to join the wrought-iron pipes together in straight lines, or at angles to each other, by means of screw-threads on the pipes and fittings.

Wrought-iron tubes and fittings, to be good, should be perfectly cylindrical, with no ribs or flat places, and internally as smooth as possible. The welding should be scarcely discernible from the other parts, and the screw should be equally deep throughout the thread.

In the manufacture of service-pipes of wrought-iron, it is of paramount importance that there should be uniformity of screw-pitch amongst the different makers. In England this uniformity prevails, but in Scotland each maker follows the bent of his own inclination in this respect, the consequence being an amount of confusion and inconvenience, leading to bad jointing and loss of time in recutting the threads, which we are at a loss to understand should be tolerated for one month.

Wrought-iron pipes of smaller internal diameter than 3-4ths of an inch should never be put in the ground. There is no economy in their use. They are soon filled up with dirt and scale; if the gas is at all impure, they become clogged and contracted in their bore. The friction of the gas passing through them is enormous, and if their length is great, a high initial pressure has to be maintained to force the gas through them to give the necessary supply. The expense of labour in laying them is also as great as for pipes of larger size.

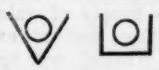
All wrought-iron pipes, if laid in the ordinary unprotected way, are subject to rapid oxidation in the ground. This is especially the case in made ground, filled up with ashes and the refuse of iron and chemical works. Under such conditions they may not be expected to last beyond two or three years. In open, porous, gravelly soil, also, through which the surface water percolates readily, their destruction is rapid. This is the case also in sandy soils in proximity to the sea, and impregnated with saline matter. In all such circumstances, it is of advantage to employ galvanized pipe, and that, too, of a strength greater than is otherwise necessary.

The average life of wrought-iron service-pipes, as generally laid, is about eight years. They are the least durable part of the distributing plant of a gas undertaking. From this statement we may realize to some extent the enormous corrosion that is constantly taking place in these pipes, the incessant renewal that is required, necessitating the tearing up of the ground, with all the waste, annoyance, and expense attendant on the process. All this may have been unavoidable, and in a large degree excusable, in the earlier years of gas lighting, when experience had to be gained, and the art of canalization had to be learned; but it is excusable no longer, when, by the use of obvious precautions, the life of pipes may be prolonged greatly beyond the time mentioned.

Putting aside the recent discovery of Professor Barff, whose process of preserving iron, if it answers the expectations entertained of it, and can be generally and inexpensively applied, will vastly extend the use of ironwork of every kind, and enhance its value in those circumstances where its use is at present indispensable, there are other expedients that may be, and are, resorted to by thoughtful gas managers and engineers. These are the careful protection of

the pipes by thickly embedding them in soil, or surrounding them, under and over, with clay, brought from the nearest accessible place, if these materials are not already found in the newly-opened trench.

Another practice, also to be highly commended, and which has been extensively adopted by The Gaslight and Coke Company in the Metropolis, is that of placing the pipe in a slight wooden trough, made of half-inch laths, three inches broad, left rough from the circular saw, and either V-shaped or U-shaped in section, into which, after the service is completed, melted pitch is poured, surrounding the pipe from its junction with the main to the wall of the premises being supplied, and completely protecting it from the deteriorating effects of air and moisture. The liability of the wood to decay suggests the idea whether it would not be desirable to use cast-iron troughs of light construction for the same purpose. These are necessary precautions in the laying of service-pipes of wrought-iron that no manager is justified in neglecting to use, and which, indeed, he will not fail to adopt if he cares for his own reputation, and the interests of those by whom he is employed.



The great bulk of the leakage of gas is unquestionably to be traced to the service-pipes, either from defects in the pipes themselves, or by corrosion, or at their junction with the mains. It follows, therefore, that the best results would arise from more careful manipulation here, and the employment of the best materials. This latter is a point on which something must be said. With some persons it would appear that the chief recommendation for the adoption of the pipes of any maker is the amount of discount that such is able to allow from the ordinary list price, the strength or quality of the metal composing the pipes being quite a secondary consideration. This ridiculous parsimony, it must be admitted, is more often an attribute of directors than managers, the opinion of the latter being frequently overruled in this as in other matters.

It is desirable to prove all service-pipes when they are received from the manufacturer. This can readily be done by plugging one end, and attaching a hand-syringe to the other. On immersing them in a shallow cistern of water, and compressing the air into them, defects will be indicated by the air-bubbles rising through the water to the surface.

Wrought-iron is not the only material used for service-pipes. These are sometimes of cast-iron down to the smallest size. Composition and tin pipes have also been tried, and lead piping, which has much to recommend it, is used exclusively by some engineers.

Cast-iron service-pipes are of great durability; but the drawbacks attending their use are such as to counterbalance any advantage in this respect. They are necessarily made in short lengths, not exceeding 6 feet long each, and the number of joints, and the consequent risk of leakage, is greater with them than with most of the other pipes mentioned. Their liability also to fracture, by settlement of the ground and overhead traffic, is obvious, and their first cost in material and laying is greater than either wrought-iron or lead.

Composition pipe is not suitable for placing in the ground, as it is rapidly destroyed by contact with the soil and moisture. Pipes made of pure tin are exceedingly durable; but the cost of the material necessarily precludes its extensive use for this purpose.

Lead pipes are slightly more expensive than wrought-iron, but they cost less in laying; they are more durable in most soils, and when they require to be replaced, the old material is intrinsically of value for re-melting. The objections to their employment are their liability to sink after being laid, and to be crushed and flattened, or otherwise injured, in the opening of the ground by workmen. These objections, however, can be overcome to a large extent by laying the pipes either on wood slabs half-an-inch to three-quarters of an inch thick, and protecting them by a similar covering, or by providing wooden troughs for their whole length, and embedding them in pitch as recommended for wrought-iron pipes. In connecting them to the main, the latter is drilled and tapped in the usual manner, and a brass ferrule is inserted, having a union joint, to which the lead pipe is attached by soldering. This is the only joint that requires to be made between the main and the consumer's meter, and this absence of joints and couplings is no slight recommendation in their favour. In Paris the services are principally of lead, protected by earthenware tubes, through which the pipe is passed.

(To be continued.)

Correspondence.

[*We do not hold ourselves responsible for the opinions expressed by Correspondents.*]

AUCTION CLAUSES IN GAS BILLS.

Sir,—You will doubtless insert in your "Parliamentary Intelligence" the New Standing Order *verbatim*. I need not, therefore, quote it; but a word or two upon the proceedings may be necessary to clear away any possible misunderstanding upon the result.

There is nothing in the Order, as passed, that the companies have any just cause to complain of, inasmuch as the main objection on the part of the companies—viz., that of making a hard inflexible rule, by means of a Standing Order, to treat all companies alike, irrespective of any consideration as to whether they have honourably complied with all their obligations or otherwise—is given up, and the recognition of the sliding scale removes all other valid objections.

Had it been known before the discussion commenced that Mr. Raikes intended to make these concessions, the matter might have been settled without any further opposition; but, as often happens after discussion, when one amendment is proposed upon another, there was in the end some misunderstanding as to how the question actually stood. Some members, it is to be feared, thought the companies had got all they were entitled to ask for, and were unreasonable in carrying the opposition further, while others thought that all the companies had asked for had been refused.

After the division, application was made to what was supposed to be the official source of information, and there we were informed that Mr. Bristowe's motion had not been put. W. Livesey.

Gas and Water Companies Association, 6, Victoria Street, Westminster, S.W., April 21, 1877.

Sir,—Permit me to correct an error in your "Circular" of the 17th on this subject. You say such clauses were never, you believe, embodied in a Gas Act before 1856; but you have overlooked the cases of Ashton-under-Lyne, in 1847, section 15, and of Nottingham, in 1853, sections 22 and 23. In both of these Acts all the new shares were required to be offered by auction.* And it is scarcely correct to say that in all the cases quoted by you, except the most recent, the auction clauses were introduced voluntarily by the promoters of the Bills; for in many (I think 16), in which either part or the whole of the new shares are required to be sold by auction, I was myself concerned, and was more or less instrumental, by opposition, in causing the insertion of the clauses referred to.

With regard to the metropolitan legislation of last session, resulting in the introduction of auction clauses into the Bills of The Gaslight and Coke Company and the South Metropolitan Gas Company, it is only fair it should be stated that it was I who volunteered evidence, and produced precedents, before Mr. Forster's committee, urging the imposition of the auction clauses upon the former of these two companies, as being, in my opinion, the only effectual means of bringing the capital into a proper relation to the extent of the business. This I did, as I explained to the committee, without the sanction of my clients, the Metropolitan Board of Works, whose counsel did not examine me, and only as a consequence of strong personal conviction on the subject. My evidence is recorded *in extenso* from page 212 forward in the published Blue-Book, and no evidence was furnished to the committee other than that given by me.

My own opinion is, that the exclusive monopoly which gas companies have sought to maintain—backed, as I think, unwisely, by the Journal of Gas Lighting—has occasioned much of the jealousy with which they have been regarded of late years; and I am satisfied that in urging on many occasions the sale of new shares by auction, and the consequent admission of the general investing public as co-proprietors, my course will, a few years hence at the latest, be viewed as entirely friendly, by those who at present may consider it somewhat hostile, to the interests of the companies.

Auction clauses for new capital, a fair standard price for gas, subject to revision from time to time, and a sliding scale of dividends operating inversely to the selling price, supply the antidote to nearly all the complaints current against gas companies; and it would be a very good thing, both for proprietors and consumers, if the affairs of the companies throughout the kingdom could be forthwith brought under legislation in respect to these matters. G. W. Stevenson.

4, *Westminster Chambers, S.W., April* 21, 1877.

THE GAS REFEREES PRESSURE-GAUGE.

Sir,—In the article in last week's number of the Journal, under the above heading, it is stated that "such a gauge as this, but on a more exact scale, was designed more than 30 years ago by the late Mr. Alfred King, M. Inst., C.E. of Liverpool," and further that "a similar gauge to that adopted by the Gas Referees has been made and used by Mr. W. Sugg, of Westminster, for more than five years past." To the foregoing I may be permitted to add that "such a gauge" was made and used by myself 18 to 20 years since, and I think in all probability by many others. When I constructed one I was unaware, and have remained unaware until just recently, of what Mr. King had done, and I may admit that the scale error of mine was about twice as great as given for Mr. Sugg's, but the error was compensated in the scale. I attached no importance to the thing, made no publication, and claimed no merit. The instrument was devised and made, like many other instruments and appliances of which one says nothing, to meet a special requirement; that requirement satisfied the gauge was done with, as I preferred to work with a large tube syphon gauge, or with the instrument which is universally known as the "King's Gauge," when the latter was applicable.

When, however, Mr. Harcourt's drawing and description reached me on the 25th of January last year, I recognized that he had made such improvements as to render the gauge almost a new thing—first, in the greatly increased difference between the area of the cistern and of the tube; secondly, the graduations being on the tube itself; and lastly, and it may be most importantly, the employment of the glass float, which obviates all the difficulties which attach to readings of the height of a water column terminating with a curved line due to capillarity.

Of course there is nothing new in the idea of a gauge with unequal tubes. I have seen and used one 27 years ago, devised by the late Alexander Wright. It consisted of two concentric glass tubes, with brass fittings top and bottom, and a scale whereby to read the pressure on the outer tube only. It was a very pretty gauge, but was objectionable in some respects, which I need not stay to mention. The "King's Gauge" itself generally has unequal chambers, and it can be no matter of surprise that the active and ingenious mind which invented that gauge should have also invented another of the kind in question; but it is a pity that its invention and character were not announced to the world.

I may state also that some 14 or 15 years since, at the request of Messrs. Robinson, of Leicester, I arranged a registering pressure-gauge on Wright's system, which indicated pressures on a scale of 8-10ths to an inch—the concentric cylinders being of unequal area—and these have been regularly produced ever since. Indeed, there is no practical difficulty in making such instruments to indicate on a scale of 9 or 9½ tenths to the inch, although an objection might arise in respect to their increased dimensions.

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* One other omission occurred—that of the Bristol United Gas Bill, in 1853. In that case the company introduced the clause in the Bill as deposited.—Ed. J. G. L.

I have mentioned what I consider are the points of novelty in the new gauge, and while admitting generally, with all readiness, the late Mr. King's claim to priority, I feel that Mr. Harcourt is entitled to much credit for devising a gauge which is free from the imperfections which characterized those of the kind (with the exception, it may be, of Mr. King's) which had been previously produced.

Whether a pressure register would not have been a better instrument for the Gas Examiners to employ—registering, as such instrument does, the pressure continuously during the 24 hours of day and night—is a question. I think that it would. F. W. HARTLEY.

55, *Millbank Street, Westminster, S.W., April* 18, 1877.

IMPROVEMENTS IN PRESSURE-GAUGES.

Fig. 1.

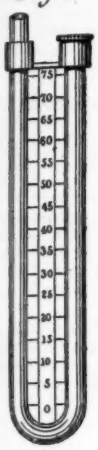
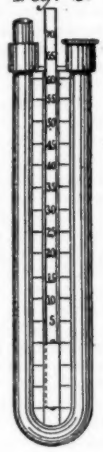


Fig. 2.



SIR,—In taking observations with the ordinary U-shaped pressure-gauge, some confusion and liability to error arises, particularly amongst inexperienced or uneducated persons, owing to the use of the zero mark in the centre of the scale; there is also the trouble of regulating the zero line.

I have designed a form of scale that removes these difficulties. It is applicable to any form of the U-gauge, and therefore available for any of the uses to which that instrument is applied. It consists, firstly, in numbering the scale consecutively from either end (fig. 1); and secondly, in the use of a slide similar in form to that in the slide-rule (fig. 2). The scale slide and divisions may be of any required size. Fig. 2 is particularly suitable for an exhaust gauge, as the slide may be set to show the amount of suction required. The level of the liquid in the gauge is of no importance, provided that it is at a greater distance from either end than the maximum pressure to be indicated. In fig. 1 the results are obtainable by simple subtraction, and in fig. 2, by adjusting the zero mark of the slide to the level of one liquid surface, the amount of pressure is indicated by the other.

Westbury, April 10, 1877. H. N. HUMPHRYS.

EXPANSION JOINTS FOR GAS-MAINS.

SIR,—In your issue of the 23rd of January you notice the manner of jointing the gas-mains in Callao, Chorrillos, and Iquique, and as I am not aware that the same has been used elsewhere than in this Republic, it may interest you to know something of its history.

In 1852 the writer, being then a pupil of the late Mr. George Lowe, was entrusted with the preparation of designs for gas-works for this city—Lima. Among other local circumstances which had to be kept in view were the earthquakes to which this place is subject, and although these received more attention than was subsequently found to be necessary, they were the cause that suggested the use of vulcanized india-rubber.

The only experience then available was that derived from some experiments by Mr. Lowe at Brick Lane, from which it appeared that the vulcanized india-rubber withstood the action of common London gas after passing the condensers or scrubbers. These experiments having been of limited duration, and it being intended to use in Lima gas of high illuminating power, it was considered advisable to use a form of spigot and socket which would admit of reversion to a lead or rust joint in case of the rubber failing. The first form was, therefore, that of a common spigot and socket, the socket being a little longer than usual, and very slightly bell-mouthed, to facilitate the entrance of the ring, and the spigot being without a bead, but having a slight hollow round the end instead, to retain the ring in its proper position on entering. Provision was made for laying the whole of the mains—from 12 inches downwards—in this manner; but when the mains were being laid, 30-candle gas having been determined upon, the writer, fearing to risk the whole on an unproved plan, laid rather less than one-half—some 14 or 15 miles—with rubber, and the rest with lead.

The rubber joints were a source of anxiety for many years, and every opportunity was taken for examining them, without discovering cause for regret.

In 1865, when the Callao works were projected, several lengths were taken up, carried to the works on men's shoulders, without any precaution to keep the joints from bending, and when proved—the ends being sealed with water and mercury—the rubber joints were found all but perfectly gas-tight. The sealing with water and mercury is mentioned, because, in the first instance, when the ends were simply closed with turned hard wood-plugs, painted, and puttied with red lead, there was a sensible fall in the pressure-gauge, although no escape could be detected either at the plugs, the rubber joint, or the fittings. On setting the pipes on end in a bucket of water, and sealing the upper end also with water, the escape was found in small bubbles of gas coming through the pores of the wood. The upper end was then filled with mercury, and the joint proved with about 15 inches of pressure. When the gas supply was cut off, the gauge rose and fell with the daily variations of temperature, showing not more loss than was probably due to the condensation of the gas, to leakage through the pores of the metal, or to absorption and exhalation by the rubber itself.

Callao was, therefore, all laid on this plan, as shown by your fig. 28, omitting the bead, however, at the commencement, in order to retain the option of recurring to lead joints. Emboldened by further experience, the lead was added, and with it the mains of Chorrillos, Iquique, and Arequipa, as also all extensions here and in Callao, have been laid. Every new superintendent has been cautioned to watch the joints well, and, so far, all reports received have been quite satisfactory.

Before Callao was laid, samples of rings of various qualities were obtained from different manufacturers, and tested by hanging them in an atmosphere of gas for periods varying from two or three days to as many weeks. They were all found to increase more or less in bulk and weight, some of the inferior kinds even exfoliating and almost dropping away, so that it is important to use the best quality only.

Some of those used at first in Lima, after being exposed to the air for a year or two became hard and brittle, apparently by the evaporation of the naphtha or other solvent employed in their manufacture, but when laid in the pipes they were not so affected. It appears that whatever solvent is imbibed at their inner edge only serves to keep them in an elastic state, and that any excess is given off at the outer edge.

They do, however, take a decided set. A ring of, say, three-quarters of an inch in diameter in the solid, after being compressed to three-eighths of an inch in a joint, and left for a few months, if taken out and exposed to the air, would probably never recover its original form, and for this reason the writer has never used them in water-mains.

Notwithstanding what precedes, the writer does not consider the propriety of their use in all circumstances as yet quite established.

He has only further to correct a small error regarding the Chorrillos gas. It is certainly not less than 26 candles for 5 feet per hour, and the consumption per public lamp is nearer 2½ than 2 feet per hour. It is impossible to get at the exact amount of leakage, but at most it is very small.

Lima, March 13, 1877. A. PRENTICE.

QUANTITY OF BRICKWORK IN RETORT-SETTINGS.

SIR,—Your JOURNAL is one of the few periodicals that comes to hand regularly. Whatever may be the cause, I thank Heaven for the bounty.

Well, having received my paper, I, of course, soon dip into its contents, and am happy to find that things are moving so smoothly in the dear old country; but now and then I meet with an old friend, though dressed in a new costume, as, for example, the retort-setting figured in your issue of the 30th of January.

This system is claimed as having been invented in Germany some 15 years ago. I think I used it at Doncaster and Rotherham some 22 years ago, and a modification of it, for five retorts, was published by the late T. G. Barlow, Esq., in 1856. I can vouch for its success as a means of heating retorts to a very high temperature; but it requires the retorts and furnace bricks to be of very first-rate quality; and, to remedy the defect caused by the use of inferior bricks, I had recourse to additional transverse supports. This leads me to say a word or two in reference to much or little brickwork in the setting of retorts. I must confess I have been compelled to abandon my old notions about very open settings, and say that my practical experience leads me to believe in a little excess, rather than any deficiency, in support to clay retorts, and I will proceed to give a very practical proof.

I came to these works under very peculiar circumstances, and had to improvise almost retorts to carry on the manufacture. To complete a couple of benches of through retorts, I had to use up a number of short pieces of retort, some of them less than 3 feet long. In this oven I had to put in more supporting walls than usual, to accommodate the varying lengths of my pieces; in fact, I have a great excess of brickwork, but I do not find that I consume more fuel in these furnaces than in the others, and the heats are far more uniform. I quite endorse the idea that the extra brickwork, when once heated, acts as a reservoir of what would otherwise be sent up the main flue, and thus equalizes the temperature of the retorts. The great drawback I have to contend against is surface radiation. The arches of the benches here are 8 feet 6 inches wide by 8 feet 3 high, and arranged for eight retorts—five large-sized ovals, and three 15-inch round ones. The loss of heat by radiation is something enormous, even with 14-inch front walls.

This leads me to say a word to those who design gas-works for foreign countries, and beg of them, when they are arranging their retorts and other working plant, to remember that they are not within 24 hours of Birmingham, Glasgow, or Newcastle-on-Tyne, and that they have poor, ill-fed workmen to deal with, and not the sturdy stokers who feed on good beef and bread, and who can stand before a furnace or bench of retorts without fainting or getting sick. I have now had nearly 20 years experience in gas-works in foreign countries, and I am more than ever convinced that, if the working plant of many establishments were designed for the special requirements of the climate and circumstances of the localities where the works are to be carried on, the capital invested in foreign gas-works would be far more productive than it is, and instead of paying 5, 6, and 7 per cent., which many works do at present, 10, 15, and 20 per cent. might be realized.

I had hoped I should have been in England before the next meeting of the British Association of Gas Managers, when, if permitted, I might have said a few words about retort-houses in hot climates. I fear, however, I shall not be in England so soon, so I must retain my growlings until another opportunity; in the meantime, I shall watch with interest the discussion on retort-settings. The retorts are the life's blood of a gas-works; if they be ill, all the rest of the system is deranged, and will drag on but a defective existence. HENRY GORE.

Buenos Ayres Gas Company, Limited (late Mutual Gas Company), March 12, 1877.

MR. VERNON HARCOURT ON SULPHUR PURIFICATION.

SIR,—I have just read with astonishment Mr. Harcourt's statement respecting gas purification, in his lecture published in your JOURNAL of to-day—viz., that sulphide of sodium and sulphide of ammonium are alike incapable of absorbing the bisulphide of carbon (or, to use the parliamentary phrase, the "sulphur in other forms than sulphuretted hydrogen") from coal gas. But when reading the mode of experiment adopted by Mr. Harcourt for trying the effect of these materials, my astonishment ceased—or rather, it assumed a new form; I ceased to be surprised at the results which he obtained, but was filled with astonishment that any one conversant with gas purification, still more an eminent chemist, should have conducted such experiments in such a manner.

Mr. Harcourt has a model washer for ammonia, in which the gas is purified from ammonia by passing the crude gas *over the surface* of the water. Whether this washer removes the last traces of ammonia, Mr.

Harcourt has not ascertained, but he believes it is capable of doing so, and probably this may be the case. Now, this effect of water upon ammonia has been not only known, but applied in gas-works for many years. To take one instance, well known to every gas engineer in London, the "Livesey scrubber" (not the greatly superior and admirably perfect washer which Mr. Livesey has recently invented) is constructed precisely on this principle of passing the gas, not through water, but over an extensive watery surface; and four or five of these scrubbers have been in successful use for many years at the South Metropolitan Gas-Works. But what suffices for ammonia does not necessarily, or even naturally, suffice for the sulphur purification. The affinity of ammonia for water is extraordinary, whereas Dr. Odling, and every one who has properly experimented with the bisulphide of carbon, have recognized and stated the fact that this kind of gas impurity can only be absorbed from gas slowly, or by prolonged contact with the purifying materials employed. But even to take the case of impurities, which are easily and rapidly absorbed in the purifying processes, would any gas engineer (or, one would have thought, any chemist) ever dream of purifying gas from H_2S, by merely passing it *over the surface* of oxide of iron, or of extracting the CO_2 by passing the gas *over the surface* of lime? Or, to come to the bisulphide of carbon, Mr. Harcourt finds (as I was the first to show, five years ago), that when the gas has previously been properly prepared, especially by the elimination of the CO_2, the bisulphide of carbon will be *thoroughly* extracted by passing the gas through sulphide of calcium. But certainly I never imagined that this absorption would take place if the gas were merely passed over the surface of sulphide of calcium. And if Mr. Harcourt tries sulphide of calcium in the same manner as he has chosen to try the two other alkaline sulphides (viz., of sodium and ammonium), by merely passing the gas *over the surface* of the purifying material—and if he chooses, as he has done relative to the two other alkaline sulphides, to give the results of his experiments authoritatively to the gas world—he will have to astonish gas managers anew, and in the teeth of five years experience to the contrary, by declaring that sulphide of calcium is totally inefficient for extracting the "sulphur" from gas.

Let Mr. Harcourt pass the gas *through* these two liquid alkaline sulphides, and then he will find that they *do* absorb the "sulphur," and that most efficiently. In the beginning of 1872 I made dozens of experiments with the sulphides of sodium and ammonium, and I found them quite as efficient as the sulphide of calcium. I used these solutions in a small tin scrubber, about 4 feet high, filled sometimes with coke and sometimes with pumice, through which the gas, as supplied to the public, was passed, after being freed from its CO_2. The analyses of the gas so purified were made by Mr. W. H. Thompson, the Chemical Assistant of the Referees, whose ability, carefulness, and integrity are a sufficient guarantee to all who know him for the correctness of the results. These analyses, with the conditions of my experiments, were regularly entered by him in his note-book, which, since his premature and lamented death in 1874, I have been unable to recover. But I have still some loose MS. pages, in which I entered, at the time, the results of some of the earliest of those experiments—those which naturally most interested me at the time. From this contemporaneous MS. I extract the following experiments, the analyses, as I have already said, being made by Mr. Thompson:—

Sulphide of Sodium in Coke Scrubber.

	Sulphur remaining in Gas.
Experiment 1 (imperfect)	7·8 grains per 100 feet.
„ 2	5·09 „ „
„ 3	4·2 „ „
„ 4	5·47 „ „
„ 5	3·8 „ „
„ 6	4·23 „ „

With Double Scrubber.

Experiment 1	4·8 grains per 100 feet.
„ 2	5·4 „ „

I remember that in one of these experiments with sulphide of sodium, the gas so purified contained only a *fraction of a grain* of sulphur. Mr. Harcourt, in his lecture, states that he believes the "sulphur" can be *wholly* extracted by sulphide of calcium, as employed by the process which I made public in 1872—a statement which accords with the results which I obtained five years ago; and I venture to repeat that equally good results can be obtained either from the sulphide of sodium or the sulphide of ammonium.

But I carried my investigations of the action of soda and ammonia upon the sulphur impurity much beyond this—indeed, into ground which, certainly so far as public knowledge is concerned, is even now a *res nova*. In my patent of March, 1872, I attacked the sulphur impurity systematically, and at every practicable point, as indeed is evidenced by the fact that, although no less than £3000 has been spent by the present Referees in experiments to discover some other means of extracting the sulphur, no other such means have been discovered.

One of the several processes deliberately planned and tried by me in 1872 was the employment of soda and ammonia in their simple state of caustic alkaline solutions; my object in doing so being to act upon the bisulphide of carbon through its acid or acidulous character, but always applying my new principle of previously *preparing* the gas, by the extraction of the other elements, CO_2 and H_2S, which would combine with these materials, and destroy their alkaline action on the bisulphide of carbon. In my contemporaneous memoranda I find the following experiments:—

Soda in Coke Scrubber.
(No lumps on top.)

Experiment 1.—Sulphur left in gas	14·65 grains.
„ 2.—Ditto do.	16·9 „
„ 3.—Ditto do.	18·8 „

Soda in Pumice Scrubber.
(Lumps on top.)

Experiment 1.—Sulphur left in gas	20·1 grains.
„ 2.—Ditto do.	20·9 „
„ 3.—Ditto do.	21·13 „

Ammonia (Half Strength) in Coke Scrubber.

Experiment 1.—Sulphur left in gas	12·5 grains.

These experiments (and I made several others) show that, provided the gas be previously *prepared*, in the manner which I was then the first to make public, the action of simple caustic alkalies *in solution* is capable of reducing the "sulphur," steadily and reliably, to about one-half its ordinary quantity. This was really a great result to be obtained at that time, and by a cheap and simple process; and if this method is now (very rightly) disregarded, it is only because I simultaneously made public processes which were perfect, and entirely efficient for the same purpose. One point in connexion with the action of these simple alkaline solutions in absorbing the bisulphide of carbon (provided the gas be previously suitably prepared by the extraction of the CO_2 and H_2S) is worthy of notice—namely, the new proof thereby given of the well-known chemical fact, that substances act more efficiently in the liquid than in the solid form; because, as is well known, fresh or caustic lime, an equally potent alkali, yet which, owing to its being but slightly soluble, is most efficiently employed as a solid, is incapable of extracting the bisulphide of carbon from gas. This superior action of *solutions* over *solids* is pointed out at considerable length by Dr. Frankland, in his essay, in the latest edition of "Clegg," the passage ending with a quotation and adoption of one of the oldest chemical *dicta* in existence—"*Corpora non agunt nisi sint soluta.*"

At the time I made my invention, no method had been devised for revivifying gas liquor without a serious loss of the valuable ammonia, owing to its extreme volatility; and hence I gave my attention to soda (which is non-volatile) as well as to ammonia. But now that Mr. Hills, by an improvement of his apparatus (which I am surprised is not in general use in gas-works), has successfully accomplished this most valuable object, a solution of caustic ammonia will, of course, be preferred to the use of soda; in fact, as I can state, on the authority of Mr. G. Livesey, caustic ammonia (in the form of gas liquor revivified by Mr. Hills's apparatus) can now be obtained at *one-half the cost of lime*, besides the *saving of labour*, by employing washers or scrubbers in lieu of purifiers, which require constant filling and emptying.

In addition to all this is the fact that, by using alkaline solutions, whether of soda or of ammonia, according to my process (now well known), the gas can be entirely purified from beginning to end *in closed vessels*, which occasion no nuisance; and purifiers can be (and even upon economical grounds I make bold to say ere long will be) wholly dispensed with. All this is to be found stated expressly in the specification of my patent five years ago.

I have but one word more to say. The present Gas Referees, in their letter or report to the Board of Trade, dated the 5th of March, published in your JOURNAL of last week, while stating "that it is not to be denied that the refuse lime is offensive," speak as follows:—

"We believe that much more lime is used than is requisite for the purpose of removing sulphur. At least nine-tenths of the lime employed serves another useful but quite distinct purpose, that of removing carbonic acid, and thus improving the illuminating power of the gas. If other means (such, for example, as are now in use at the South Metropolitan Gas-Works) should be found available for the removal of carbonic acid, the discharging of a lime purifier would be a much less frequent event, and might be conducted in a more leisurely and careful manner."

Now, turn to my Specification (March 9, 1872), and you will see that I made the same remarks five years ago, and also, *inter alia*, recommended the ver process which, since 1874, has been employed at the South Metropolitan Gas-Works, and which is now recommended by the present Referees. The following is quoted from my Specification:—

"*Note.*—Lime is a dirty material to use in gas-works; moreover, however used, it is objectionable on account of the nuisance which it occasions to the neighbourhood; accordingly it is desirable to *reduce the quantity of lime used in gas-works to the smallest amount necessary*. As hitherto employed, lime has been used to purify gas from sulphur in all forms—namely, both from sulphuretted hydrogen and from the sulpho-carbons, &c., &c." (p. 10.)

I then show how an alkaline solution, whether of soda or ammonia, can be advantageously employed antecedent to the desulphurating vessels, according to my then new principle of gas purification, "*thereby eliminating all the carbonic acid.*" (p. 12.) And my third claim (omitting, for my present purpose, the mention of the other alkalies than NH_3) stands thus:—

"The employment of caustic . . . ammonia, used in washers or scrubbers in the manner hereinbefore described, to eliminate the carbonic acid from coal gas, and in such manner as to convert the lime in purifiers into sulphides of calcium, and also, if required, to maintain them in that condition."

Is not this exactly the process now employed at the South Metropolitan works, and recommended by the present Referees?

R. H. PATTERSON.

22, *Wingate Road, Hammersmith, April* 17, 1877.

NEW YORK GAS SUPPLY.—The *Polytechnic Review* states that the New Municipal Gas Company of New York have accepted a charter by which they agree to furnish gas of illuminating power not less than 16 candles; to supply the city buildings with gas for 2 dols. per 1000 feet; to light the street-lamps for not more than 20 dols. each, and not to charge private consumers above 2 dols. 40 cents each 1000 feet used; to expend at least 10,000 dols. a year in laying mains, and to restore the pavements to a condition satisfactory to the Commissioner of Public Works.

RIVER POLLUTION IN AMERICA.—The New York court has been occupied four weeks in the hearing of a case affecting the dairy interests of that State. The plaintiff, Julius T. Howard, is a farmer in the vicinity of Chardon, Geauga county, and he owns a farm on a stream just below a cheese factory belonging to a New York dairy company. He declared that the slops and whey from this factory polluted the stream which supplied his farm with water, and as his cattle drank the water, the flow and quality of milk from his dairy was diminished. It was also alleged that the stream thus polluted was a nuisance and a source of disease to persons in the neighbourhood. The case was a test one, as several other farmers had suits pending on the same ground, and the expense was shared jointly among them. On March 23, after a very patient hearing, the jury awarded the plaintiff five dollars damages. The reason for the smallness of the damages was because the costs, which would be borne by the defendants, were unusually heavy, 186 witnesses, mostly scientific men, having been examined.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, APRIL 16, 1877.

A petition against dispensing with Standing Orders in the case of the Dublin Improvement Acts Amendment Bill was presented from Ratepayers and owners of property in Dublin.

TUESDAY, APRIL 17.

The Examiners reported that no further Standing Orders are applicable to the Rotherham Corporation and the Warrington Corporation Gas Bills.

The following report from the Standing Orders Committee was agreed to:—"That the Standing Orders not complied with in respect of the Dublin Improvement Acts Amendment Bill ought to be dispensed with, and the Bill allowed to proceed, provided that all clauses, except such as relate to the water supply of the city of Dublin, be struck out of the Bill, and that costs only shall be allowed in respect of that portion of the Bill, such costs to be taxed by the proper officer of the House of Commons."

The Edinburgh and District Water, the Falmouth Water, and the London Corporation Bills were read a second time, and committed.

THURSDAY, APRIL 19.

The Examiners reported that no further Standing Orders are applicable to the Dundee Gas and Middlesbrough Corporation Bills.

The Falmouth Water and London Corporation Bills were reported, without amendment.

The Blackburn Borough Gas, Water, and Extension Bill was read the third time and passed.

FRIDAY, APRIL 20.

The CHAIRMAN of COMMITTEES informed the House that the promoters do not intend to proceed with the Dublin Improvement Acts Amendment and the North-East Worcestershire Water Bills during the present session.

The Edinburgh and District Water Bill was reported, with amendments.

HOUSE OF COMMONS.

MONDAY, APRIL 16, 1877.

The adjourned debate on the amendment proposed to the new Standing Order, "Gas Companies Additional Capital," was further adjourned from Tuesday, the 17th, to Friday, the 20th inst.

On the motion of Sir CHARLES FORSTER, the order of Feb. 21, "That the Limerick Gas Bill be committed," was read and discharged. Bill withdrawn.

The Examiners report, "That the Standing Orders have not been complied with in the case of the petition for additional provision in the Newcastle and Gateshead Water Bill," was referred to the Select Committee on Standing Orders.

A petition in favour of the Epsom and Ewell Gas Bill was presented from Owners, &c., of property and consumers of gas in Epsom and neighbourhood; and one in favour of the Hanley Corporation Gas Bill from Inhabitants and consumers of gas in Smallthorne.

The petition of the London and North-Western Railway Company against the Dukinfield and Denton Local Boards of Health Bill was withdrawn.

The *locus standi* of the following petitioners has been disallowed:—Stalybridge Gas Company against the Ashton-under-Lyne Gas Bill; Ratepayers and owners of property in Stoke-upon-Trent against the Newcastle-under-Lyme Borough Extension and Improvement Bill; Consumers of gas, and ratepayers in Dukinfield, except such of the petitioners as are consumers of gas, against the Dukinfield and Denton Local Boards of Health Bill; Corporation of Newport against the Newport (Monmouthshire) Gas Bill.

TUESDAY, APRIL 17.

The following report from the Standing Orders Committee was agreed to:—"That, in the case of the Colne Gas Bill, petition for additional provision, the Standing Orders ought to be dispensed with—that the parties be permitted to introduce their additional provision accordingly, if the committee on the Bill shall think fit."

A petition was presented by Mr. Whitwell, from the Kendal Gas and Water Company, against the proposed new Standing Order.

A petition in favour of the Perth Water Bill was presented from Ratepayers and inhabitants of Perth.

The petitions were withdrawn of the Corporation of Leicester against the Leicester Gas Bill; and of the Bridgend of Perth Water Company, Limited, against the Perth Water Bill.

The Bridgwater (Corporation) Water, Bristol District Water, Bristol United Gas, and Christchurch Gas Bills were referred to a Select Committee, consisting of Mr. Pease (chairman), Mr. Dalrymple, Lord Edmond Fitzmaurice, and Mr. Boord; to meet on Tuesday, April 24.

The Sunningdale District Water, Epsom and Ewell Gas, Crystal Palace District Gas, and The Gaslight and Coke Company Bills were referred to a Select Committee, consisting of Mr. D. R. Plunket (chairman), Mr. Foljambe, Mr. Lewis Starkey, and Mr. Courtney; to meet on Thursday, April 26.

WEDNESDAY, APRIL 18.

The Reservoirs Bill was read a second time and committed.

The petitions were withdrawn of (1) Dukinfield and Denton Local Boards, (2) Earl of Stamford and Warrington, against the Ashton-under-Lyne Improvement Bill; and of (1) Earl of Kinnoull, (2) Feuars of the Earl of Kinnoull, against the Perth Water Bill.

The *locus standi* of the Sutton Gas Company, as petitioners against the Epsom and Ewell Gas Bill, has been disallowed, except as against clause 4 of the Bill, and so much of the preamble as relates thereto.

FRIDAY, APRIL 20.

The following resolution of the Standing Orders Committee was agreed to:—"That in the case of the Newcastle and Gateshead Water Bill, petition for additional provision, the Standing Orders ought to be dispensed with—that the parties be permitted to introduce their additional provision accordingly, if the committee on the Bill shall think fit."

The Tudhoe and Sunderland Bridge Gas Bill was reported.

The petition of the North British Railway Company against the Perth Water Bill was withdrawn.

AUCTION CLAUSES IN GAS BILLS.

The adjourned debate on the proposed new Standing Order—"That in every Bill in which an existing gas company is authorized to raise additional capital, provision shall be made for the offer of such capital by public auction or tender, at the best price which can be obtained"—was opened by

Mr. RAIKES, who said: In resuming the debate which commenced on this subject a fortnight ago, I wish to say, speaking on the amendment of my honourable friend the member for Cambridgeshire to the Standing Order I ventured to suggest to the House, that I do not wish to detain the House at any length, because I stated my views on the subject generally on the first occasion. One particular point was raised by my honourable and learned friend, and another point was raised by the honourable and learned member for Dewsbury, both of which are certainly worthy of consideration, and on which I should wish to say a few words while the amendment is before the House. The point, sir, which was raised by the honourable and learned member for Dewsbury, took the form, as the House will remember, of a question addressed to yourself, and the point, shortly stated, was whether it was desirable or proper to allow a Standing Order of this House to come into collision with, or override, a general public Act of Parliament, and you, sir, said that the question so put by the honourable and learned member for Dewsbury admitted of a simple answer. You said that a Standing Order is not a legislative proceeding, but is only a direction to a committee of this House to do certain things in regard to a particular Bill, and it is on the action of the House, and not on the action of a committee, that any change in legislation is effected. After that question had been answered, however, I believe that some doubts arose in the minds of some honourable members of this House, which I shall be anxious, if I can, to remove on the present occasion—that it would be more constitutional that the proceeding should be by Bill rather than by Standing Order. As I said on that occasion, I should, of course, prefer a Bill, because that would relieve me from the duty of enforcing the Standing Order, and transfer the burden to the shoulders of Her Majesty's Government. But I wish to limit that preference to personal grounds, because I cannot see any constitutional grounds for preferring a Bill on this matter to a Standing Order. I think that the question as to contravening an Act of Parliament by Standing Order which was raised by the honourable and learned member for Dewsbury was effectually disposed of by the ruling of the chair; but I wish to go into the question a little further, and ask what Act it is that it is supposed this Standing Order is likely to contravene? I do not see the honourable and learned member in his place, but it will be recollected by the House that the question was put on rather general grounds, and it is one in which the question of technical procedure is so mixed up, and so necessarily mixed up, with the question of public policy, that it is difficult to separate these two ideas in the minds of many honourable members. But I should like, if it is supposed that this Standing Order is likely to contravene a public Act of Parliament, or a private Act, to go into this question. Let us take the particular case of some gas Act; let us suppose a gas company which had obtained an Act in 1867, and had incorporated into that Act all the provisions of the Companies Clauses Act of 1863, could it be for a moment pretended that Parliament, by passing a particular Act in 1867, dealing with the particular matter then under consideration, could have precluded itself from acting in 1877 as it should think proper with regard to matters which were never contemplated in 1867? It appears to me impossible to sustain that proposition for a moment. I do not think any one will contend that the clauses relating to additional capital in the Companies Clauses Act, and which are supposed to be incorporated in that particular Act, can have reference to any capital not then in contemplation. But then it is supposed by some of the honourable gentlemen who think with the honourable member for Dewsbury, that the Companies Clauses Act—the Act of 1863—is itself a barrier against such a proceeding in a matter of this sort, and that it is a violation of guarantees. Now, as I said before, these two questions get so mixed up, that it is exceedingly difficult to separate them. Well, I wish to ask whether the gentlemen who have raised this question are familiar with the Act of 1863? Do they think that that Act is one of universal application? Do they believe that it was in any way intended to be an unalterable code? If so, why are we every year passing a number of private Acts. What is the title of that Act? It is:

> An Act for consolidating in one Act certain provisions frequently inserted in Acts relating to the constitution and management of companies incorporated in carrying on acts of a public nature.

Turning from the title to the preamble, I find it is stated:

> And whereas sundry provisions of the like nature, but not comprised in the said general Acts respectively, are very frequently introduced into Acts of Parliament relating to such companies, and it is expedient to comprise such last-mentioned provisions in one general Act, such Act to be applicable to England or Ireland or to Scotland as the case may require, and that as well for the purpose of avoiding the necessity of repeating such provisions in the Acts relating to such undertakings as for ensuring greater conformity in the provisions themselves.

Could there be anything plainer in the world than that this was a skeleton Bill, a sort of model Bill, and that it was passed by Parliament as incorporating such general provisions as might be thought expedient to introduce into particular Acts? Let us look at clause 3 of that Act, part 1:

> This part of this Act shall apply to every company, incorporated either before or after the passing of this Act, which obtains a special clause incorporating this part of this Act.

Why have limited its provisions to such Acts as should contain a particular clause incorporating this Act? Let us come to clause 12:

> Where any company, incorporated either before or after the passing of this Act for the purpose of carrying on any undertaking, is authorized by any special Act hereafter passed, and incorporating this part of this Act, to raise any additional sum or sums by the issue of new ordinary shares, or by the issue of new ordinary stock, or (at the option of the company) by either of these modes, then, and in every such case, the company, with the sanction of such proportion of the votes of the shareholders and stockbrokers entitled to vote in that behalf at meetings of the company, present (personally or by proxy) at a meeting of the company specially convened for the purpose of raising the additional sum or sums from time to time, create and issue (according as the authority given by the special Act extends to shares only or to stock only, or both) such new ordinary shares, of such nominal amount, and subject to the payment of calls of such amounts and at such times as the company thinks fit, or such ordinary new stock as the company thinks fit.

The limitation is as clear and precise as a limitation can be—that it is only to apply to those particular Acts which incorporate this particular clause in this Act. In asking Parliament to pass this Standing Order, I am asking Parliament to lay down a rule for the direction of its committees in relation to gas companies in future, if they should not incorporate this Act. I am willing to do credit to the objections raised by the honourable gentleman who first raised this point—that a Standing Order applies either to a general Act or a particular Act—but I am more certain of nothing than that this Standing Order will not override nor clash with the provisions of any gas company's Act now in force, or of the Companies Clauses Act. Now we come to the question of the breach of faith; that depends on whether there was anything like guarantee of future capital; but I confess that I should be very unwilling to do anything which might be supposed in any way to trench upon any rights which had been guaranteed by Parliament. But I think the two apprehensions must stand or fall together. Either we are doing something by this Standing Order—I hope we are doing nothing—by which we shall upset the existing state of things under which it is said there is a guarantee; or, if we are not interfering with the existing state of things, we cannot be said to be committing a breach of faith. And one or two points I may mention which have occurred to me since this matter was last under discussion. Of course the principal question is as to the effect of passing such a Standing Order. The honourable and learned member for Cambridgeshire is now in his place, and I wish particularly to commend to his consideration what I am going to say. There was a Bill brought before Parliament in the present session granting further powers to the Leicester Gas Company. That Bill has not been formally withdrawn. It is, I understand, on the point of

being withdrawn, and why is it going to be withdrawn? The Bill was opposed by the Corporation of Leicester, on the ground that it proposed to raise additional capital for the purpose of enriching the shareholders rather than in the interests of the public. Since that Bill was introduced a change has come over the spirit of the parties, and an arrangement has been come to by which the Leicester Corporation are to take the concern, and to pay perpetual annuities in this proportion—the existing A shares, on which £13 has been paid, and the price of which in the market is now from £23 to £24, are to receive 26s. 3½d.; the existing B shares, on which £10 has been paid, and the price of which in the market is from £15 to £16, are to receive 17s. 2d.; and the existing C shares, on which £10 has been paid, and which now commands the price of from £14 to £15, will receive 16s. The company are very glad to accept these terms from the corporation, and why? Because, as was said at the meeting, "Mr. Raikes has given notion of a motion which will take the virtue out of the Bill." Well, I am glad that, if this motion has not any other effect, it at least has given the inhabitants of Leicester the opportunity of coming to terms with the gas company in that town. There is another case, that of a much larger company. I am now referring to the report of The Gaslight and Coke Company for the year 1876, and I am looking at what I believe to be a faithful report of the proceedings of a meeting of that company. The governor made a long speech just after the company had obtained their Act, which had been referred to the committee of which my right honourable friend opposite was chairman, and that committee had inserted the auction clause which I am now proposing shall be introduced in all future gas Bills; and they had also inserted the clause providing for a sliding scale of profits. I do not wish at this moment to offer an opinion on the latter point, because I think we had better dispose of the amendment of the honourable member for Cambridgeshire in the first instance. But this report states, first of all, the views of the directors of that company with regard to the sliding scale, and then it comes to the question of the auction clause, and the governor of the company, who is a very good authority on this subject, said: "I think, gentlemen, we have not done wrong in accepting them, but as I expressed my opinion, and the opinion of the Board, on a former occasion, I will only repeat what I said then, that I think it is a most valuable enactment." And he goes on to say—I will summarize it—that when a gas company make an addition to their capital, of course a great premium is realized, being the difference between the market value of the shares and the nominal value, but at the present time that goes into the pockets of the shareholders, and does not go to the company in a company point of view, but if the premium is realized by the company it will add to the value of the stock of the company, and the effect will be to send up the value of the shares immediately by some 10 or 12 per cent., and therefore he thought the auction clauses were based on sound policy, and were likely to be to the interest of the proprietors. I must now say a few words on the amendment of the honourable and learned member for Cambridgeshire. By that amendment he, in point of fact, accepts the principle for which I contend. He admits that care should be taken by this auction clause to protect the interests of the public, but he wishes to throw on those who represent the public the onus of proving the necessity in each particular case. There is another amendment before the House to which I referred in my opening statement a fortnight ago. There is an amendment which says in effect that the auction clauses are to be recognized as a matter of public policy, but they are not to be enforced in every case. The committee may insert them if they think proper, but if they do not they are bound to state to the House the reasons why they have come to that conclusion. That shifts the onus on to the gas companies. I confess I think that when a general rule is laid down those who propose an exception to it should state their reasons, therefore I think that this amendment ought to be accepted. But I am not at all prepared to adopt the amendment of the honourable and learned member for Cambridgeshire, because, while it accepts the principle as sound, it proceeds in operation to make it as unsound as it can possibly be, and I think it can scarcely be worth the paper on which it is printed. I have only a word or two more to say, which I might spare the House, but I see the honourable member for Sheffield in his place. He was not here in the early part of the discussion, and so did not hear what was said as to this being a constitutional proceeding, and I may, perhaps, be allowed to recapitulate to the House what I have said. I have pointed out that the provisions in the Companies Clauses Act, which it is supposed the Standing Order might come in collision with, is one which provides only for such cases as shall in express terms incorporate that Act in their Act. It is not an Act of general application. It requires that any company who are to avail themselves of it shall incorporate its clauses, or those parts of the Act which they think proper, in their Bill. We are laying down a rule that this may be done by a Standing Order. I apologize to the House for having detained it so long in this matter, but I think it is a question of such great public importance that I should hardly have been justified in making the proposal I have if I had made a less lengthened statement. I can only assure those gentlemen who are interested in gas companies that I do not contemplate anything which might diminish the value of their property, and I trust that they will find that my proposals will not only add to the value of their property, but that they will also be for the interest of the public.

Mr. Knatchbull-Hugessen: After hearing the speech of my honourable friend a fortnight ago, the question struck me, why is not this matter a proper subject for a Bill? In my opinion a change of this kind should be carried out only by a Bill which, having passed through both Houses of Parliament, should receive the sanction of the Crown, and I ask the House whether there is not great constitutional danger in having a Standing Order to supersede an Act. My honourable friend proposes that the auction clauses shall be inserted in every Bill. I do not know whether that provision will be good or bad for the gas companies, but I want to know why the Select Committee to whom the Bill is referred should not decide whether the clauses should be inserted or not. And it seems to me that my honourable friend has a certain distrust of his own proposition, because he has accepted an amendment which says that there shall be added to the Standing Order the words "unless the committee on the Bill shall report that such provision ought not to be required, with the reasons on which their opinion is founded." The committee on a Bill will do one thing or another. They will either adopt the provision or not, but the amendment says that they shall state their reasons. Well, that is a somewhat new provision, and for my part I object to these innovations, and unless it can be shown that there are very good reasons for it, and I do not think my honourable friend has made out a good case for it, I do not think it should be adopted.

Colonel Beresford said it struck him that this was a proposal which was more worthy of an arbitrary Government than of an English House of Commons. His honourable friend said that this Standing Order would not repeal an Act of Parliament. He said, on the contrary, that it would repeal all the Acts that had been passed on the question up to the present time, and that without giving the parties affected the opportunity of stating their reasons against it. This was a very serious question when they looked at the enormous amount of capital involved, not only as regarded gas companies, but as regarded other companies of a like character. On a former occasion the Chancellor of the Exchequer said: "It is a stringent measure to deal by a Standing Order with such matters as this, and I think that to pass a Standing Order of this sort without further legislation is rather an arbitrary step." He (Colonel Beresford) said that such a clause as that now proposed would be unjust to nine out of every ten gas companies in the kingdom. It might be agreeable to those companies who for a long time had paid their statutory dividends, but it was unjust to those companies who wanted to raise additional capital. In fact, this was an attack on capital, and if this Standing Order were allowed to pass, he warned all members of the House who had any interest in railway and other companies, that the same legislation would be applied to them as a matter of course. A change of this kind, if made at all, should be made by Bill, and he did not see why the House should depart from the usual course.

Mr. Goldney: In reply to the observations of the last speaker, and as showing the absolute necessity of some such Standing Order as that proposed by the Chairman of the Committee of Ways and Means, I may state that in 1867 I had the honour and pleasure to sit on a committee on gas legislation, of which Lord Cardwell, then Mr. Cardwell, was the chairman. We sat from the 10th of May till the 3rd of August taking evidence, and the result was a very elaborate report, drawn up by Lord Cardwell, the chairman, as to the principles which should guide gas legislation, which was generally accepted by the gas companies. Looking at the enormous capital possessed by the gas companies, it is almost impossible to affect them by competition. In 1868 the City of London Gas Act was passed, and in 1869 a Bill of the Imperial Gas Company was passed by the committee, and brought down to this House for the third reading, without any of the provisions which the committee of 1867 sought to enforce for the protection of the public. We held that that Bill should be sent back to the committee, with instructions to insert these clauses; but three members of that committee stood up in this House, one after another, and said they had never heard of these resolutions which had been so deliberately agreed to, and that if they had been brought under their notice they would have passed a very different Bill. I say that that of itself shows the absolute necessity of the attention of committees being directed to the great principles on which legislation of this kind should proceed, and that it is absolutely necessary we should have something like consistent legislation, especially when we are dealing with questions of this kind. One of the standing recommendations of the committee was that when any future capital was to be raised, it was the bounden duty of Parliament to see that that capital was raised by bonds, or in some other way, at the cheapest rate, and not by the issue of new shares or stock. I think the resolutions of that committee show the absolute necessity of this House laying down certain regulations to be followed by the Select Committees on Bills, and, therefore, I heartily support the Standing Order now proposed.

Sir H. Jackson: I think this motion involves two questions—one of law and the other of policy. Both points have been debated at some length. One seems to be perfectly clear; the other is a matter for consideration. On the question of law, I agree with the view propounded by the honourable member for Chester. It seems to me that every Select Committee should have the power of imposing on any gas company who propose to raise additional capital, the auction clauses or the sliding scale, or any other conditions, where they think the justice of the case requires it. And if that can be done in isolated cases by committees, I fail to see why the House should not adopt a general rule, which should be applicable to all cases, assuming it to be satisfied that the rule proposed is one which it is expedient to adopt, and if the Standing Order is protected by the proviso suggested by the honourable member for the borough of Cambridge. But that brings me to the real question, and that is, is this Standing Order one that it is expedient for the House to adopt? Now, I venture to say that, if we look into this question, it is quite easy to ascertain what the grievance is, which, it must be admitted, is felt in almost all towns where there are gas companies incorporated by Acts of Parliament. The grievance is that these companies enjoy what is virtually a monopoly. There is no competition. Consumers are obliged to go to a particular merchant and buy the article they want at his own price. But the question is, how is that admitted evil best to be dealt with? Is it to be dealt with by Parliament saying, once for all, that additional powers, in the future, shall be given to the local authorities? If that is so, let Parliament say so, either by a Standing Order or by a Bill. If, on the other hand, you say that the present system is advantageous to the consumer, that the terms on which this privilege has been conceded have been shown by experience to be beneficial—in other words, that the limit of 10 per cent., which Parliament imposed years ago, when the manufacture of gas was to some extent an experiment, should be maintained—is Parliament to say that for the future no additional capital shall be raised but at a price less burdensome to the consumer than the 10 per cent. or the 7 per cent., which I believe is the rate at which new capital is generally raised? Let us look at the sliding scale, on which a good deal has been said. It has been adopted in order that the price to the consumer may be regulated; but my honourable friend, in trying to effect this object, seems to me to set about it in the most inconvenient way that could possibly be devised, because, instead of saying to the companies which have got these parliamentary powers, "We mean to limit the advantages which you are to derive from them," what he says is, "We mean to interfere as much as possible with your internal arrangements." I venture to submit that that is not the best way to carry out the object he has in view. Many companies would like to have power to raise their capital by auction. By all means, if they wish it, give them that power; but why force it upon them? Why interfere in the internal affairs of a company, in a way which, I do not say must, but which may, cause the greatest possible inconvenience? It seems to me that this is a reasonable objection to this proposal. If Parliament has created these companies with certain rights and expectations, it is a pity that it should stultify itself when, as I think, the object which the honourable gentleman seeks to attain might be gained by a different kind of regulation—either by a Bill or a Standing Order. I hope that the matter may be allowed to stand over for further consideration, and that the honourable member will not press it to a division, but will consider whether the same object cannot be carried out in a less objectionable manner.

Mr. Heygate: The honourable member for Chester has referred to the Leicester Gas Company. I have no shares in that company, but I may be permitted to say that the statement that this company had proposed to raise capital that was not required for the purposes of the town, is entirely unfounded. I do not know where my honourable friend got his information from, but I assure him that it is a suggestion that has not been made as yet by any of the opponents of the Bill. I do not know why that reference to the special case of Leicester has been made. He referred to it, in bringing forward this motion, as having been the means of causing an arrangement between the gas company of Leicester and the corporation; but I do not know how it can be argued that that is a reason for this measure, unless he means to suggest that this proposal was used as a means of enforcing unfair terms on the company. Now, I will not venture to contest the legal question which has been so often referred to by previous speakers. I have certainly been under the idea—and I confess that I am still under the idea—that the resolutions proposed by my honourable

friend are, in point of fact, a repeal of the understanding, if not of the actual Acts on which these companies were formed. A very large amount of money has been invested in gas companies by the industrial classes throughout England, certainly under the assumption that they were, at all events, to have the benefit which might accrue to them from the future issue of capital. And here let me say that many are under the impression that a certain dividend has been secured by Act of Parliament; but what these companies really secured by previous legislation was not a security for any dividend, but simply a limitation of that dividend. Well, if this is the case, if all this amount of capital has been created under the impression that any benefit that may be derived from the issue of new capital is to go to those who hold the shares. I think my honourable friend, even if he is right in saying that a Standing Order does not repeal a previous Act, would do well to consider whether it would not be better for him to proceed by Bill instead of by Standing Order. We should then, at all events, have the advantage of considering the matter more fully and fairly than we can now do. I do not promise that if he brings in a Bill he will have my vote. I have not yet heard that it is a politic measure, or one that is good for the country. To restrain the outlay of capital is a very objectionable thing. What would be the result of establishing a rule of this kind? Why, that no gas company would have an interest in extending the mains to outlying districts; but as soon as they got up to their existing capital, they would not lay out a single sixpence beyond it. Well, you may say that other companies would come in to supply this want; but that is not so easy, and if new companies did come in, they would not be able to supply gas so cheaply as the old companies. Therefore, I say it would be impolitic, and not to the advantage of the community at large, certainly not to the advantage of the outlying suburbs of towns, to establish such a rule as that now proposed. I say more. I say it is impolitic on higher grounds for Parliament to legislate in a manner injurious to the interests of these small capitalists. These gas shares are mainly held by the middle classes, and is it not better that they should put their money into investments of this kind rather than put it into Turkish and other foreign loans? It is to the interest of the country that we should encourage local investments of this description, and if it should happen that they return a good dividend, I think they should not be meddled with.

Mr. W. E. Forster: I do not agree with my honourable friend who has just sat down, nor with the honourable member who preceded him. I think that the Standing Order now proposed by the Chairman of Ways and Means, with the addition of the amendment of the honourable member for the borough of Cambridge, will be a settlement of the matter. But the question we have to consider is, whether it is desirable to aim at the object at which the Chairman of the Committee of Ways and Means does aim, and whether the Standing Order is the best way of doing it. Now, with regard to the object, I would not have ventured to trouble the House at all if I had not been referred to two or three times, and if I had not had some experience in gas Bills in the past year and the year before. My honourable friend opposite (Mr. Goldney) said he was a member of the committee of which Lord Cardwell was chairman. I had the honour of being a member of that committee too. In that inquiry we were dealing with the most powerful gas company in the kingdom—The Gaslight and Coke Company—and yet we found the change was accepted. The sliding scale was opposed quite as strongly as the auction clauses, but afterwards it was accepted; and, with regard to the auction clauses, so little was the feeling against them that they were not in any way opposed last year, when The Gaslight and Coke Company brought in a Bill, and when they were accepted at once, without, as I recollect, any real discussion on the matter. The doctrine of establishing a statutory limit of not more than 5 per cent. for future capital was hardly mentioned in the discussion. The foundation of the discussion with these large companies was this—they had set to work to do a large and important business in the Metropolis, and by going to Parliament for additional powers it was thought that the matter could be placed on a better footing by an arrangement that would guarantee 10 per cent., certainly enable them to obtain 10 per cent., and a price was fixed which, generally speaking, would give 10 per cent.; but the question came up, "You can make gas much cheaper, and you ought no longer to have this large price, but you ought to be reduced to a lower price;" and a regulation was then made that if, on the one hand, the company thought they should not get 10 per cent., or if, on the other hand, the consumers thought they would get more, there should be an inquiry. Well, on that question we had to consider whether that was the best mode of dealing with the matter, and we came to the conclusion that it was a clumsy way of doing it. The proprietors were perfectly sure of obtaining 10 per cent., but they were not to have more, and that might lead to extravagance. The committee thought they would try to introduce the principle of hope and fear by tempting them with a sliding scale, by which, if they could make gas at a lower price than what was fixed, they could have a higher dividend, and if they charged a higher price they were to have a lower dividend. The auction clauses did not come before us. We were dealing with a Bill of the Metropolitan Board of Works, which did not contain the auction clauses, and therefore we had not the opportunity of considering them. The opinion, I think, of us all was that the auction clauses would be of great advantage. The position of the companies is this—they are pretty sure of 10 per cent. by the sliding scale, and, in some cases, a little more. Their dividend, at any rate, was a round 10 per cent., and if they can get anything like that dividend for future capital it is to their interest to be as extravagant as possible, in order that they may divide 10 per cent. on future capital; and the payment of 10 per cent. instead of 5 on future capital will, of course, prevent a reduction in the price of gas to the consumer. Now, that is the state of the case, and I think it only fair to say to gentlemen who have got this good property—"It was given you as a monopoly, and the least that we ask of you is that if future capital is raised you must give the benefit to the public." My honourable friend the member for Leicester says there is no inducement to lay out more capital. Well, I give the practical answer that the largest company in the kingdom do not think so. But I may also say that there is this very evident object, that it strengthens their position, and enables them to be more sure of getting their dividend on their original capital; and if, indeed, they were to follow the opposite suggestion of my honourable friend, and say, "We will not supply the outlying districts," the result would be that they would be obliged to be in competition with another company, who would lay down mains. My honourable friend the member for Sandwich (Mr. Hugessen) seemed to think that this was a novel mode of dealing with private companies; but there are Standing Orders with regard to railways quite as imperative as this. It seems to me that, as it is now worded, it is merely a strong suggestion to a committee to put in these clauses, unless there are some special reasons to the contrary. I can hardly conceive such reasons. I say that the Standing Order is more to the interest of the public than a Bill, because a Bill would apply to only one company, whereas the Standing Order applies to all companies, and it is a better mode of effecting the desired object than by having recourse to a Bill.

Mr. Roebuck: I have been told since the last debate that I did not quite see the force of the statement of the honourable gentleman, the Chairman of Ways and Means, that a Standing Order does not override an Act of Parliament, that there is no general Act of Parliament on the subject, but that this is a mode of procedure quite in accordance with the rules and orders of the House. It appears that there are three parties interested in this question. There is, first, the public; then there are the companies; and next the individual shareholders—and the interests of the individual shareholders are not always coincident with the interest of the companies. By the mode of proceeding proposed, the interest of the public and the interest of the companies will be consulted, and not simply the interest of the shareholders. I cannot suppose there can be any difficulty in passing the resolution, which, by serving the interest of the companies, will enable them to sell gas cheaper, and thus serve the interests of the public. I shall support the resolution.

The Attorney-General: I think it desirable that there should be no doubt as to the legal position of the matter, and with regard to the question as to whether this proposed resolution infringes an Act of Parliament, it was suggested, when this discussion came on some days ago, that it was an unconstitutional measure, and that, in fact, the House of Commons had no power to pass such a resolution. My honourable and learned friend the member for Dewsbury laid down that doctrine, and with the greatest possible confidence appealed to you, sir, and in answer to his inquiry you seemed to me to have at that time very satisfactorily and completely laid the ghost, so to speak, of that constitutional difficulty. But still there seems to be some lurking doubt in the minds of some gentlemen who have taken part in this discussion, and there may be a lurking doubt in the minds of some who have listened to the discussion, whether there are any legal difficulties in the resolution, and I think it desirable to say a few words on that subject. Now, it appears to me that the Chairman of Ways and Means has explained the matter very clearly indeed. Assume for a moment that there was in existence some Act of Parliament that provides for the case—that enacts that, when additiohal capital was raised, that additional capital should be offered to the shareholders of the company. Even supposing that there was an Act of Parliament having a provision of that sort, I cannot conceive how a resolution of this House, that it should be an instruction to a committee sitting upon a gas Bill that a provision of a different sort should be inserted would be any infringement or contravention of that Act of Parliament, because the committee would insert the clause according to their instructions, and the Bill would come down to this House and be dealt with by the House, would then go from this House to the upper House, and might be dealt with there, and in the last stage it would receive the Royal Assent. It would pass through all the stages of legislation. The instructions of the House would not contravene the Act of Parliament or interfere with its provisions, but it would be the legislation of Parliament which might or might not interfere with the former legislation of Parliament. But it is not necessary to consider the matter in this aspect, because it is perfectly clear that there is no Act of Parliament in existence, such as that which is suggested by my honourable and learned friend. The Act of Parliament which was relied upon by my honourable and learned friend, and was the foundation of his constitutional difficulty, was the Companies Clauses Amendment Act of 1863; and all that Act of Parliament does is to frame, so to speak, a number of miscellaneous clauses, and to state that those clauses may be inserted in Bills which shall come before committees, if the committees choose to insert them; and, therefore, the committees that sit upon gas Bills may or may not, just as they please, insert in those Bills the provisions of this Act of Parliament, and if they do incorporate them, then those provisions will become law. Therefore, it really stands thus: that there is no Act of Parliament whatever to be infringed; there is nothing compulsory on a committee to adopt the provisions of the Companies Clauses Amendment Act, 1863, and this Standing Order cannot, by any possibility, infringe the Act of Parliament. It has been asked, "Why do you not proceed by way of Bill?" I will ask in return, why proceed by Bill when what you want to accomplish is so much more easily accomplished by Standing Order? If you refer to the Standing Orders with reference to Railway Bills, you will find that Standing Orders 153 to 160 are instructions such as are proposed by the Chairman of Ways and Means; and when this has been done over and over again—when there are precedents—why should it not be done in these cases? There seems to be but one argument apart from the legal difficulty, and it is this. You say that the shareholders have some kind of right to have offered to them the additional capital. What right have they? They certainly have no legal right, and why should they have even a hopeful expectation of it? Does it follow that because the House has dealt with them too leniently in previous cases that it should continue to do so? The real truth of the matter is this, that these gas companies have a monopoly; and it is requisite that Parliament in some way, either by a Standing Order as is proposed, or by an Act, should protect the consumer.

Sir Charles Adderley: I will not detain the House more than by saying a word or two as to the intentions of the Government. The Board of Trade suggested that the auction clause should be introduced into the two Bills for regulating gas companies last year by the committee over which the member for Bradford presided, they thought that was no less than an act of justice to the public; and it appears that the companies generally throughout the country have adopted the auction clause. The poverty of the gas companies in their earlier undertakings led Parliament, in 1847, into the extraordinary act of practically fixing for them an artificial profit. The Act of 1863 is simply a Clauses Act, in the nature of a Standing Order. A committee might suggest that clauses in that Act might be inserted in a Bill, and unless they are so inserted they have no force whatever. The section of the Act of 1863 which stated that new capital shall be offered to shareholders at par, cannot be looked upon as applicable to gas companies which have already had so large an advantage given them by the Act of 1847, securing to them a dividend of 10 per cent., and giving them an absolute monopoly. It is only when the committee on a Bill think fit that the clauses in the Act of 1863 which state that new capital is to be offered at par to shareholders are incorporated into a Bill, and this cannot be construed into the right of shareholders to have such a bonus added to their shares. This was no part of the original bargain with the gas companies; and though it is argued that it is a bonus given by Parliament to them, that position is clearly untenable. Holding these views, the Government are prepared to accept the motion brought forward by the honourable gentleman the member for Chester, and the addition that is proposed by the honourable member for the borough of Cambridge. The Government are willing to add words further, to this effect, that where additional capital is offered by auction, and the bid of a proprietor is equal to the highest bid of a non-proprietor, the proprietor shall always be declared to be the purchaser. I think that a fair offer to the shareholders of gas companies.

The House then divided on Mr. Rodwell's amendment, to leave out from the word "capital," in order to add the words, "it shall be an instruction to the Select Committee to consider the expediency of provision being made for the offer of such capital by public auction or tender at the best price which can be obtained."

For the amendment	84
Against it	256
Majority against	172

Mr. Marten moved to add the words, "unless the committee on the Bill

shall report that such provision ought not to be required, with the reasons on which their opinion is founded."

Mr. RAIKES said he hoped the House would accept the amendment. He thought it would ease the operation of the Standing Order, and make it less drastic.

The amendment was agreed to.

Mr. BRISTOWE moved another amendment to add at the end the following words:—"In the case of every such Bill it shall be competent to the committee so to regulate the price of the gas to be charged to consumers that any reduction of an authorized standard price shall entitle the company to make a proportionate increase of the authorized dividend, and that any increase above the standard price shall involve a proportionate decrease of dividend." He said this was in the interests of the consumers, but was fair to all parties.

Mr. RAIKES said he quite agreed with the amendment. He thought the sliding scale was a great improvement on the previous arrangements. He thought there should be a general power to all committees to insert the sliding scale in any Bills that came before them.

The amendment was then agreed to, after which the Standing Order, as amended, was put and carried.

SATURDAY, APRIL 21.

The petition of the Great Western Railway Company against the Bristol District Water Bill was withdrawn.

HOUSE OF COMMONS COMMITTEE.

TUESDAY, MARCH 20.

Before Mr. ASSHETON, *Chairman; Messrs.* SMITH, BELL, *and* DUNDAS; *Mr.* BONHAM-CARTER, *Referee.*)

RAMSGATE LOCAL BOARD BILL.

(*Continued from page* 590.)

At the conclusion of Mr. Balfour Browne's speech,

Mr. POPE said he proposed to call his witnesses on behalf of the gas and water companies and reserve any remarks he might have to make until the close of the evidence.

In reply to the Chairman, Mr. MICHAEL said the Bills of the two companies would be taken together.

Mr. *H. Curling*, examined by Mr. MICHAEL.

I am Chairman of the Isle of Thanet Gas Company, and also of the Ramsgate Water-Works Company. I have been for 30 years a shareholder in the gas company, and for 20 years the chairman. I have taken an active part in the management of the company, which was commenced under the provisions of an Act in 1824, with an original capital of £12,000, with power to raise an additional £4000. The company had five miles of mains laid at first. The cost of the works and mains was £13,500, but the extras brought it up to £15,411, leaving for working capital £589. There were 800 £25 shares, upon which no dividend was paid for the first two years. In 1826 there was a dividend of 2½ per cent.; in 1827 none; in 1828 and 1829, 5 per cent. In 1830 the directors hoped to have declared a dividend of 10s. but in consequence of expenditure upon the works the dividend was only 8s. per share, or 4½ per cent. The profit-rental at that time was £920 3s. 4d. From 1830 to 1847, 5 per cent. was paid. In September, 1847, the directors recommended that the paid-up capital should be henceforth considered to be £20,000, upon which 5 per cent. should be paid. They had then expended £5280 out of profits for enlarging and improving the works, of which £3024 had been spent at Ramsgate, and £2256 at Margate. In 1847 the consumption of coals was 1726 tons; the gross receipts £3253 11s. 8d., and the expenditure £1985 16s. 7d., leaving a profit of £1267 15s. 1d. Between the years 1847 and 1862, 5 per cent. was divided. In 1862 a resolution was passed that the capital should be considered as £24,000, £11,523 having up to that time been taken from profits for the enlargement and improvement of the works—at Ramsgate, £5899 and at Margate £5624. Since that time 10 per cent. has been paid upon £24,000. The company have had no reserve-fund, and had no power to create one. They formed a surplus fund of the profits left after paying the dividends, but that was all expended upon the works. Since 1862 the total amount spent on improvements has been £52,339 19s. 1d.—£24,693 17s. 1d. at Ramsgate, and £27,646 2s. at Margate. We seek by our Bill to capitalize £48,000 as improvement stock. In reality that represents a balance of £61,143, so that we lose £13,000 in not applying to Parliament to capitalize that money before. The gas was originally charged for at so much per light, but on the introduction of meters the price was 12s. per 1000 feet; that was about 35 years ago. The price was subsequently reduced down to 4s. per 1000; but in August, 1872, it was raised to 4s. 6d., owing to the coal famine, and in May, 1873, to 5s. In January, 1875, it was reduced to 4s. 6d., and in July of that year to 4s. Before the price was raised the company were paying 13s. 8d. per ton for coals, but the cost rose to £1 1s. 7d. in Ramsgate, and £1 1s. 11d. in Margate, and subsequently to £1 11s. 7d. per ton, which was more than double their former price. The present price is 19s. in Ramsgate, and 20s. in Margate, including dues. The price of coal rose in May, 1872, but the charge for gas was not raised until August. Our price has always been less than in neighbouring towns. The price of coke varies very much. The average price per chaldron last year in Ramsgate was 9s. 3½d., and in Margate 10s. 5½d. There is not a very active demand for coke, and to get rid of it we make contracts with manufacturers in the county of Kent, if we can, to take large quantities. In 1872 our coke averaged 10s. 7½d. per chaldron; and in the coal panic year, when coals rose upwards of 114 per cent., coke only fetched 17s. 5½d., or 63 per cent. in excess of the previous year. Last year the average gross price of coke at Margate was 10s. 5d., and at Ramsgate 9s. 3½d., but that price is not now maintained. The lowest contract price this year was 7s. per chaldron, but that is for a large quantity, and to be taken away monthly. We have done all we could to get the inhabitants to consume the coke. The charge for the public lamps has always been less than that to private consumers. The present rate at Ramsgate is 3s. 10½d. per 1000, with 10 per cent. discount. We advised the local board to burn the gas by meter, and we believe they have been very well satisfied, as we have heard no complaint since. There are 257 public lamps in Ramsgate, 62 in St. Lawrence, and 226 in Margate. In the latter town the lamps are paid for by the year, but they are put out two hours sooner than in Ramsgate, which makes the charge appear less. In fact the charge was calculated on the same rate as Ramsgate, with a discount of 10 per cent. With respect to the wind blowing out the lamps, that is no advantage to the company, as the gas escapes. [Witness read two letters, one from the local board, asking that the pressure might be increased, and the reply from the gas company, to the effect that the pressure was regulated by the local board themselves, so that each lamp might burn 4 feet per hour, and that they might increase the pressure at their own pleasure.] The pressure on the mains is double what is required to burn 4 feet per hour. Care has been taken to keep the gas free from sulphuretted hydrogen. The gas is purified with oxide of iron; it is tested every day, and the test-papers are preserved. The directors received nothing for their services during the first 12 years. In 1836 they received £100 and the sum was increased at various times till 1861, since which time it has been £515 per annum. There are seven directors. We erected separate works for the supply of Margate and Ramsgate, which have been enlarged out of the profits as the business increased. We have at Ramsgate about three acres of land, partly in Ramsgate and partly in St. Lawrence, and have every modern appliance for making gas. When Mr. Stevenson asked to see the works, I took him over them, and also over the water-works. The maximum make of gas in 24 hours in mid-winter has been 270,000 feet. There are ten miles of mains in Ramsgate and three in St. Lawrence. The number of consumers in Ramsgate is 1679, and in St. Lawrence 151. The population of Ramsgate in 1871 was 14,182, and if it has since increased at the same rate as in the previous ten years it would at present be 15,522. I estimate the visitors in the town during the season at 13,131. A large number of excursionists come and go again on the same day. There were 3147 houses in Ramsgate and 1106 in St. Lawrence. The rating of Ramsgate has been altered very much. From 1871 to 1876 it was £66,007 10s., and in December it was raised to £76,357, but it has since been reduced to £72,846. The number of houses being built is not large. Since 1871 we have relaid four miles of mains. At Margate the works cover nearly three acres, and are also supplied with all modern requisites. The maximum make of gas there is 180,000 cubic feet in the 24 hours. The population of Margate in 1871, was 14,005, and the number of houses 3374; but it increases very much in summer. The number of consumers is 1445. The average number of lamps lighted during the past year was 250; the total number reported "bad" was 263, and reported "out" 284. The total number of complaints in Ramsgate was 252, from which 87 must be deducted for false reports of fittings; the legitimate number of complaints being 165. There had been very few complaints at Margate. When the directors received a deputation from that town, the principal grievance appeared to be that the directors met at Ramsgate, to which we replied that there was a manager at Margate, to whom any complaints might be made. We do our best to keep the lamps in such a state of repair as to prevent them being blown out, but in the streets leading from the cliffs there is a strong gully of wind.

WEDNESDAY, MARCH 21.

Mr. *Curling* recalled, and further examined by Mr. MICHAEL.

The water company were incorporated in 1835, with an original capital of £10,000, and with power to raise an additional £5000, all in £10 shares. Up to January, 1847, the amount actually paid up in cash was £9000. Our first outlay was £7850, and these works were constructed under the advice of Mr. Easton, sen., who is now dead. No dividend was paid during the first two years; 5s. per £8 share was paid in 1837, or £3 2s. 6d. per cent.; in 1838, 8s. per share, or 5 per cent.; and in 1839 and 1840, 12s. per share, or 7½ per cent. In 1840 the rates charged for the water were lowered, and in the following three years a dividend of only 10s. was paid, or at the rate of 6¼ per cent. In 1838 the water was analyzed by Dr. Bostock, who reported that, upon the whole, it might be regarded as of considerable purity, and in all respects adapted for domestic purposes.

By the COMMITTEE: That was the water from the Southwood well—the first that was sunk.

Examination resumed: In 1849 the directors reported that £1341 6s. 5d. had been expended out of the profits of the undertaking in the extension of pipes, and enlargement of wells and buildings, all rendered necessary to meet the demands of an increasing population; and the directors recommended that a sum of £1000 be carried to capital account, and that in future the dividends be calculated upon £10,000. At that time the shareholders also resolved to supply certain poor inhabitants gratuitously, and that was done for several years. The rental increased from £1387 13s. 8d. in 1846 to £1868 12s. 2d. in 1850, when a dividend of 16s. per £10 share was declared, being at the rate of 8 per cent. Up to that time the directors had received no remuneration for their services, but in that year £100 was allotted to them. In 1851 the dividend was raised to 20s. per share, or 10 per cent.; but in 1852, from the increased expenses incurred in the supply of water, which was still given gratuitously to the poor by means of fixed standards, the dividend was reduced to 16s. per share, or 8 per cent. In 1853 the directors came to the conclusion that the supply of water was not sufficient for the demand, and Mr. Easton recommended a new well to be sunk and fresh adits to be made, which was done, and in 1854 the dividend was reduced to 14s. per share, or 7 per cent. In 1855 the directors were advised to purchase land and erect works at Whitehall, at an estimated cost of £5000, which was raised by the issue of £10 shares. During the years 1855 and 1856 no dividends were paid to the shareholders, but in 1857 and 1858 a dividend of 5 per cent. was paid. In 1859 we paid 6 per cent., and laid by £200 to form the commencement of a reserve-fund. In 1860 we paid 6 per cent., and added £259 19s. 1d. to the reserve-fund. In 1861 we paid 7 per cent., and added £316 0s. 4d. to the reserve-fund. In 1862 and 1863 the dividend rose to 8 per cent., and in the latter year we added £276 13s. 2d. to the reserve-fund. In 1864 we, at a cost of £2606, erected a new engine, capable of raising 600 gallons of water per minute. In 1865 and 1866, notwithstanding a new assessment of the property in Ramsgate, a dividend of 8 per cent. was declared; and in 1869 it was at the rate of 9 per cent., and, in addition, £146 10s. 8d. was added to the reserve-fund. In 1870 we paid 10 per cent., but in that year it was found necessary to obtain an additional supply of water by lengthening the adits, at a cost of £1955 8s. 8d.; and in 1871 the adits were still further lengthened, at a cost of £1001 4s., but these expenses were met out of the reserve-fund. In 1873 a new reservoir was constructed and covered in, capable of holding 650,000 gallons, the cost of which we have just finished paying, amounting to £3555 19s. We are entitled by our Act to charge 7½ per cent. on the gross value of the property, but that has never been done since I have been connected with the company. Houses rated below £50 are charged at the rate of 1s. 1½d. in the pound, or 5·6 per cent.; from £50 to £60, 1s. 0½d., or 5·2 per cent.; from £60 to £70, 11½d., or 4·8 per cent.; from £70 to £150, 10½d., or 4·4 per cent.; from £150 to £200, 10d., or 4·15 per cent.; and above £200, 9d., or 3·7 per cent. No extra charge has been made for water-closets or baths. When, owing to the increased demand, we commenced charging for the poorer houses, the scale was fixed at 6s. per year, or 1$\frac{5}{19}$d. per week, being at the rate of 3 per cent. on houses rated at or under £8 per year, whilst the Public Health Act limits the amount to 8s. per year, or 2d. per week—that is, when exercising compulsory powers of supply. Our charge to manufacturers, brewers, and so on, has been 1s. per 1000 gallons, but that has been reduced when we have made large contracts with railways, and in 1875 we reduced it to the local board from 1s. to 9d., on the understanding that they would take 3 million gallons. The local board have never applied for a supply for sanitary purposes, which we were unable to afford. The instance given by the local board of their being unable to obtain a supply, on one occasion, because the shipping was being attended to, arose because the turncock was engaged in trying whether a vessel was seaworthy, and could not attend to the wants of the board immediately. Since we were in Parliament last year, orders have been given for a new engine, at a cost of £4500, and also for a new well and additional pumps. In addition to that, we have purchased a valuable right of forming adits under another large piece of ground, and those works are all proceeding as fast as possible. We have incurred an outlay at the present time of £6000 or £7000, but there is a great deal more contemplated. We have taken power in our Bill in order to pay for those works.

All the houses have cisterns, which are filled daily, excepting 37 small houses, which draw direct from the main, by a tap from the areas. Since the supply has been given on the Sunday no complaint has reached the company of any deficiency in the lodging-houses, nor has it reached their collector, although he has been requested by the board to report whenever any one made a complaint. We do not allow, under any circumstances, a direct service from our mains to a water-closet. On the contrary, our inspector has repeatedly asked, when he has been sent round, over and over again, to all the small cottages, to see that there has been no communication made direct from the main to the closet; but when the drainage was first introduced among the smaller houses, the local authority gave orders for the water to be supplied to those closets without a cistern. As soon as that was found out by the company, they gave orders to have it removed, and I find that the inspector has only discovered five cases. When we fixed the sum of 6s. per year for the cottages, it was done in order that the poor might have the water at a cheap rate, and we allowed them to obtain a supply from a pipe and tap to save the expense of a cistern. Some years ago, during the time of the cholera, I made a report, stating that in a space of 11,244 square yards, 166 shallow cesspools were confined, being at the rate of 68 to an acre, but although eleven years have elapsed, sewers have not yet been laid in some of the streets in the centre of the town, notwithstanding memorials have been presented from the inhabitants. I also wish to state that the joints of the sewer-pipes have not been properly secured, so that their contents have escaped into the chalk tunnels in which they lie, and that diminishes the water at the outfall of the sewer. Instead of advising hand-pail flushing, which is amongst the very lowest classes of society the only effectual mode of dealing with water-closets, the local board put taps over the pans, which, as soon as we found it out, we had removed. We have power to superintend the connexion of the services with our main, and then we have power to go into the house to examine the cisterns and ball-cocks, and see there is no waste; but we have no further power over the fittings of the houses, and if any nuisance is created it would be under the control of the local board, according to the Public Health Act. With regard to the effect of chalk water on health, it is very well known that this water is more binding than laxative; it is also well known that the more our water has been used the more diarrhœa has diminished, and that is not only the case at Ramsgate, but it has been observed in the neighbouring towns of Broadstairs and Margate since they have acquired their water-works. There was a very active and able canvass made on the part of the local board against the water company, the result being that the numbers in favour of the local board were 1218, and the numbers against 777, leaving a majority of 441; but that only gives a couple of thousand votes out of between 4000 and 6000. At that time a new mode of voting was introduced, which was not understood, and a great number of votes were lost in consequence of the voting papers being irregular.

Cross-examined by Sir E. BECKETT: I should think the opinion of the town is about equally balanced. No doubt there were some of the ratepayers who took an active part in opposition to the local board obtaining the works of the companies. I can only account for the elections in February, 1876—11 out of 12 commissioners being returned in favour of the Bill of the local board—turning out as they did by supposing that the ratepayers thought it better to go in for the local board. There ought to have been an election again this February, but for some reason or other it has not come off, which would have conveyed a better test of the opinion of the town. The reason we applied to Parliament last year was in consequence of a considerable outlay of capital. We had had to borrow from our bankers, not having the money in hand, and some of my directors, who were aged men, did not like the responsibility, although I had been urging them for three or four years to apply for powers to raise more capital. There was also an agitation in the town to confiscate our property, and, in self-protection, that made us decide at once to apply to Parliament. Our Bills have been introduced because Parliament expressed an opinion last year that we ought to place ourselves under the regulations of the Water-Works Clauses Act and the Gas-Works Clauses Act, and we immediately went to work to make all the necessary arrangements for giving a constant supply, and for increasing the quantity of water we should require. We were not in the least influenced by the fact that the local board were going to bring forward a Bill; we, in fact, wrote a letter to them, telling them we had consulted counsel, who advised us that our powers were not sufficient for giving a constant supply, and that we were going to Parliament to seek for those powers.

Sir E. BECKETT: Why did you put that extraordinary statement into the preamble of the gas Bill, that you were willing to carry on that Bill if Parliament would allow you to capitalize the profit?

Witness: The Bill was drawn up by the parliamentary agents and the solicitors, but I was a consenting party to the paragraph being inserted, and I thought until now it was in both Bills.

Sir E. BECKETT: Supposing you do not get your capital "declared and readjusted," do you intend to carry on your works without a Bill?

Witness: We wish to do what is right, and we shall act under advice. I am here as a trustee for other people, and I should not like to act upon my own judgment upon anything of that sort. At the last sale of gas shares the price realized was £75 per share and that is the highest I am aware of; but very few shares have been sold, they have generally descended from father to son. The shares in the water company have varied from £20 to £31 10s. Our reason for applying to Parliament is that we wanted more capital than we could possibly get, unless we ceased paying dividends.

Sir E. BECKETT: But how does coming to Parliament and getting an Act give you any more capital? If the concern is not capable of paying interest upon its shares issued without the authority of Parliament, how is it capable of finding the interest upon its shares issued with the authority of Parliament?

Witness: The business is annually increasing, and requires to be fed with more capital; but we have not sufficient capital in the surplus profits to carry it on with. An Act will give us power of raising more money, and as the business increases the profits will increase, and that will enable us to pay a dividend upon the money which we raise. We have a floating capital of about £9100, which represents rents not collected, cost of material, and all the working capital that every manufacturing concern requires to keep it going. With regard to the meters at Margate, a great many people buy their own, while at Ramsgate they do not appear to do so. Our gas has always been tested for impurities, and for the last four or five years has been tested by a regular photometer in a dark room.

Sir E. BECKETT: About the water fittings. Do you or do you not represent that you have a sufficient control over those fittings to enable the company to cut off a man's fittings if he does not keep them in order?

Witness: If he causes waste of water, we have power to cut off his fittings. There is always waste of water in water-works, under all circumstances, but I do not think we have had a great waste. We have employed an inspector, I think, for the last 15 or 20 years. I was very sorry to hear Mr. Ellice-Clark reflect on Mr. Hindes (the then surveyor) for not having used sufficient water for flushing the sewers when he was in charge because he was a water director, and I always thought it was the duty of a water director to promote the expenditure of water as much as he could. I was rather afraid that some reflection would have been cast upon me when I was in charge of the town in the cholera year, because I was the means of closing a great number of wells, and thereby promoting the use of the water-works.

Sir E. BECKETT: You seem to be quite sorry that you were not reflected on. If you have been giving such an excellent supply all this time, how do you account for the complaints which have been made by all sorts of people, sanitary and others?

Witness: I have not heard all sorts of complaints. The chief complaints that have been made here have been made of the local board for not enforcing a supply of water on the cottages. I am not aware that all the doctors in the town, with the exception of myself and one other, are on the side of the local board. I was astonished at the number of visitors being given as 50,000, because none of the witnesses gave any reason for stating that number.

Sir E. BECKETT: Did you suggest to your counsel to ask how they made this calculation?

Witness: I did; but I do not think Mr. Leigh heard me. I was really desirous of knowing the manner in which the visitors were counted, and made so numerous, because my attention has been directed to this matter ever since last year, and I have tried different plans of arriving at it. I reckoned the hotels according to the rating. If the higher rating is taken, 133 houses are rated respectively to the poor at £40 and upwards, providing accommodation for visitors, upon the average, of 18 for each house, and the hotels come in that average.

Cross-examined by Mr. WILLIAMS (for ratepayers and consumers in the parish of St. Lawrence, in opposition to both Bills): The gas-works are half in St. Lawrence and half in Ramsgate. The village of St. Lawrence is on the high ground, and, consequently, the pressure of gas is greater than in the lower districts. The price of 5s. 6d. is inserted in our Bill in case the price of coals should go up, but it does not follow that we shall charge that price. In my opinion the petitioners against the Bill of the local board think that the affairs will be better managed by myself and my colleagues than by the local board. The statement by one of the witnesses about the water in the mains getting mixed with tar is not correct. The fact was, that some of the ammoniacal liquor accidentally got into a main adjoining the gas-works, but it was detected immediately and removed. The main was washed out within half an hour, and precautions taken that such an accident should not happen again.

Mr. WILLIAMS: About the lamps blowing out. Have you taken any precaution in the construction of the covering of the lamps which you would not take in an ordinary town to prevent their blowing out?

Witness: I am not aware that the gales at Ramsgate are worse than those on the sea-coast generally, but we have adopted the same measures which have been adopted in other towns.

Mr. WILLIAMS: With regard to the water, do you, as a medical man, believe that the supply is sufficient in summer?

Witness: I believe that very few of us actually use more than seven gallons per day, and among the poorer classes I am quite certain that quantity is not used. It has been stated that the supply at Norwich is 14 gallons, but I do not believe the whole is used.

Mr. POPE: You need not trouble about that. If you have only seven gallons per head, it is not enough.

Cross-examination resumed: There have been possibly three complaints from some of the houses on the high level, above the level of our reservoir, and in consequence we erected a tank at a higher elevation, and then a forcing apparatus. At the Granville Hotel they have a constant supply, and, therefore, I do not see how there can be any complaints; they use the water by meter. A complaint was made on Feb. 4 last of the insufficiency of the meter, and a promise was made to pay £100 per annum in lieu of meterage. We replied that we would at our own expense put up a Siemens meter, but that we objected to supply water by contract, in consequence of the great waste which had occurred when the hotel was first opened. We have lately had a new engine erected at Whitehall, because the old engine was not of sufficient power, and not in consequence of the Bill of the local board.

Re-examined by Mr. POPE: The decision of the committee last year was as follows:—"The committee find the preamble of the Ramsgate Local Board Bill is not proved, and the committee wish to express an opinion that the Ramsgate Water-Works Company and the Isle of Thanet Gaslight Company should be brought under parliamentary control at the earliest opportunity." We immediately consulted with our parliamentary agent, and with our counsel, as to our powers, and with our engineer, as to the necessary rules and regulations we ought to adopt, and we then commenced to make preparations for our Bill of the present session.

By the COMMITTEE: Our practice, when complaints are made, is to attend to them directly. Mr. Ellice-Clark mentioned a case where a direct communication between the main and the closet was allowed to go on for a year, but he did not state where it was. I believe it was in Chatham Street, and if so it was put on by order of the surveyor, and found out by us three months afterwards. When sewers were introduced, not from any ill-intention, but from not knowing enough about it, some of the services were laid on to the closets, but as soon as they were found out they were altered. I have no doubt some of the houses are insufficiently supplied, but I consider that is the fault of the local board, in not enforcing the Act which gives them power to see that every house has a proper and sufficient supply of water.

Rev. *W. Benham*, examined by Mr. LEIGH.

I have been vicar of Margate since February, 1873. The church, which is capable of holding 1200 people, is lighted and heated with gas. The supply for both purposes has, in my opinion, been sufficient. There have been no complaints of any sort from the congregation. I am told that ours is the warmest church in the town. About two years ago there was great reason to complain at the vicarage; I could not see to read, and had to use candles. The company said the pipes must be out of order, and I had them examined. The service-pipe was full of holes, into which I could thrust my finger, and the earth had fallen through. I had new pipes laid down, and have had no reason to complain since.

Cross-examined by Mr. VENABLES: I have not noticed any other improvement except that caused by the re-arrangement of the fittings.

Mr. *A. L. Stride*, examined by Mr. LEIGH.

I am engineer and general manager of the London, Tilbury, and Southend Railway. Until 1875 I was one of the district engineers of the London, Chatham, and Dover Railway, and had charge of the permanent way from Sheerness to Ramsgate. At Margate we arranged with the water company to supply the station with water, at a fixed annual rental, but the Ramsgate people said they had no data to go upon, and would prefer that we should take the water by meter. Instructions were, therefore, naturally given that the engines should water at Margate and not at Ramsgate, except in cases of necessity. When the line was first opened, in 1863, there was not much difference between the two waters, but after the alteration at the Whitehall works we found the superiority of that water over the other. That difference was soon found out by the engine-men, and they took the water at Ramsgate, notwithstanding orders to the contrary, whenever they could get it. As a proof of that, the consumption up to that time was 215,000 gallons per year, but for the year ending September, 1874,

it was 4,596,000 gallons. In consequence of that, I saw the directors of the Ramsgate Water Company, and put it to them that they must have sufficient data to go upon, as all our engines were evidently watering at Ramsgate. They met me very fairly, and agreed to take an annual sum, and I have no doubt that arrangement is still going on. The quantity was certainly ample at Ramsgate, the quality very good, and the supply constant. The pressure was so great that, four or five years ago, on my inspector's suggestion, I had all the leaden service-pipes taken out and iron ones substituted. That statement has been challenged by Mr. Veale, and it is true there were several short services left in from cisterns to urinals, refreshment-rooms, and so on; but so far as the service from the mains, that was all reinstated with iron some five years ago, because the lead pipes were always bursting. I do not understand why the man John Cook was called, because during the whole time I was there he was not either running in the district, or belonging to the place in any way. As regards the gas, I can only repeat what I said last year, that it was as good as that supplied to any other station in my district, and better than in many. I took steps last year to prevent any consumption beyond what was absolutely necessary, and I put a regulator on the meter.

Cross-examined by Mr. VENABLES: My object in artificially restricting the supply of gas at the station was to save the railway company's money. I do not know whether there is a special main to the station.

Mr. VENABLES: You said that the man named John Cook knew nothing about it; how if his name was Edward?

Witness: That would be another matter. Edward Cook was one of the worst offenders in what we called at that time stealing water, when the Ramsgate water was prohibited.

Mr. *Veale* was recalled, and said that the witness Cook was constantly employed upon that section.

Cross-examination of Mr. *Stride* resumed: The whole of that 4 million gallons increase in the year 1874 was caused by the men taking water without orders.

By the COMMITTEE: I do not say that any water out of chalk is so good as water out of gravel, but my experience is that the Ramsgate water is as good as chalk water can be, whether supplied by a local board or a private company.

Mr. *R. Braine*, examined by Mr. LEIGH.

I have been harbour-master at Ramsgate for the last eight years, and previously deputy harbour-master for eleven years. During the whole of that time we have beensupplied by the gas and watercompanies. We consume about 50 million gallons of water during the year, for which we pay £50. Beyond that there is a large supply for two steam-tugs, for a dredger, for a drinking-fountain, and for a few urinals. For lighting the harbour there are 14 external lamps, two guide-lights on each cliff, and 13 lights in the offices and workshops. The average consumption of those 14 lights for the last four years has been 414,000 cubic feet, and the supply has been perfectly satisfactory. There has also not been a single complaint about the guide-lights. My house is within the pier gates, and we have plenty of pressure there in the evening, although at one time we did not get enough in the morning. I made a complaint about that, and it was found to be in consequence of the pipe from the main being corroded, and too small. I had a larger pipe put in, and since then it has been satisfactory.

Cross-examined by Mr. VENABLES: We have special mains for both gas and water, one branch of the latter being continued to the station.

Mr. *W. G. Page*, examined by Mr. LEIGH.

I am a wine merchant at Ramsgate, and am a large consumer of gas and water. I am one of the largest gas consumers in the town, my average consumption being between 250,000 and 300,000 feet. I have every reason to be satisfied with the gas, both as to quantity and quality. I have about 26 burners, and they are kept pretty well alight in the winter time to maintain the temperature even in the cellars. I have always found the pressure sufficient. I am also perfectly satisfied with the water. I am likewise in business as a house agent, and let a good many furnished houses of the best class, and have never had any complaints from the visitors who take those houses.

Mr. *H. G. Vinlen*, examined by Mr. LEIGH.

I am one of a firm of estate and house agents at Ramsgate, and have been connected with the office for 16 years. I am a consumer of gas and water to a considerable extent, and am perfectly satisfied with the quantity, quality, and price of both. As an agent I let a great number of houses of all classes, and frequently have to pay both gas and water rates for those houses. During all the years I have been connected with the estate agency business I have never had a single complaint with reference to either gas or water. I most heartily wish everything else was as satisfactory.

Cross-examined by Mr. VENABLES: I have read some of the evidence, apparently bearing on the water supply, and it appeared to be more or less a question of the fittings. I never found that either the gas or water company gave a refusal to anybody worth supplying.

Mr. VENABLES: The sanitary inspector and the medical officer have stated that they have seen cases of the greatest discomfort in lodging-houses, and other places, from there not being enough water to flush the closets, &c. Has that ever come within your observation?

Witness: I have never met with a case of that kind, except through deficient fittings, such as where the ball-cock has been out of order. I let, perhaps, more furnished houses in Ramsgate, at rentals from 16 guineas a week downwards, than any one in Ramsgate, and I have never had a single complaint with regard to the supply of water, and, if anything was deficient, they would apply to the agent.

Re-examined by Mr. LEIGH: The only communications I have had to make to the companies from time to time have been with regard to connecting the water, and any applications I have made have always been met in the promptest manner, and with the greatest punctuality and civility.

Mr. *W. Millard*, examined by Mr. LEIGH.

I have been a plumber at Ramsgate for ten years, and in that capacity have had to go to all parts of the town, at all hours of the day, to attend to complaints about the gas and water. I have always found the complaints about the water to arise from the fittings not working in a proper manner, or from the cisterns not being large enough. The complaints about the gas I have always found arose from the fittings—generally speaking from corrosion in the chandeliers, but sometimes in the burners or in the pipes. We occasionally find a house where they have 20 lights, and only what we call a 5-light meter, and the people imagine they will get enough gas through that meter.

Mr. *W. Larkin*, examined by Mr. LEIGH.

I have been in business as a plumber and gasfitter at Ramsgate for six years. I never found any default in the supply of gas to the town. I have been called in on account of complaints, and have found that insufficient fittings were the cause. I should certainly not advise people that it is inexpedient to use gas-stoves.

THURSDAY, MARCH 22.

Mr. *G. H. Ogston*, examined by Mr. MICHAEL.

I have had considerable experience in water analysis, and analyzed, both last year and this, the water from the two wells which supply the Ramsgate Company. The analysis last year from the Whitehall well was as follows:—Total solid matter per gallon, 30·20 grains; chlorine, 3·58 grains; sulphuric acid, 1·04; nitric acid, 1·41; lime, 10·97; magnesia, 0·57; iron and alumina, 0·40; volatile matter, 2·20; and alkalies and carbonic acid not separately estimated, 10·03. The total hardness before boiling was 17°, and after boiling 5½°. The water from the Southwood well contained 34·20 grains of total solid residue per gallon; chlorine, 4·34; sulphuric acid, 1·43; nitric acid, 1·24; lime, 12·03; magnesia, 0·61; iron and alumina, 0·38; volatile matter, 2·22; alkalies and carbonic acid, 11·95. The hardness before boiling was 17·5°, and after boiling 6°. My analysis of the present year, taken on March 19, 1877, was as follows:—At Whitehall the total solid residue per gallon was 31·20; chlorine, 3·26; sulphuric acid, grains 1·38; nitric acid, 2·06; lime, 10·31; magnesia, 0·95; oxide of iron, 0·10; silica, 0·35; alkalies and carbonic acid, 10·38; and volatile matters, 2·41. The total hardness was 17·3°, and the permanent hardness 7°. At Southwood the total solid matter per gallon was 32·80; grains chlorine, 5·04; sulphuric acid, 1·28; nitric acid, 3·11; lime, 8·96; magnesia, 1·18; oxide of iron, 0·18; silica, 0·42; alkalies and carbonic acid, 9·63; and volatile matters, 3·9. The total hardness of that water was 17·8°, and the permanent hardness 6·7°. The waters are extremely pure, and perfectly fit for domestic purposes. There is no evidence of sewage contamination. It contains less ammonia, both free and albumenized than the London water, but it is, of course, somewhat harder. In my opinion there is nothing in it which would tend in any way to engender disease.

Cross-examined by Mr. VENABLES: The waters are very much the same this year as they were last. I should not expect a large demand to have any effect upon the quality of the water.

By the COMMITTEE: Chlorine is always present in larger quantities in chalk water than in river water, but the proportion in this case is a good deal less than is usual in chalk water.

Mr. *E. Easton*, examined by Mr. MICHAEL.

I am a civil and mechanical engineer, and have been personally engaged in the construction of water-works in about 45 towns. My father was the adviser of the Ramsgate Water-Works Company at their origination in 1834-35, and since that time he and I have acted as their engineers. The whole of the original proprietors were, more or less, connected with the town of Ramsgate. Under our first Act, the water was to be obtained from the chalk stratum of the Isle of Thanet. I believe my father was the first person to whom the idea occurred of obtaining water from the chalk in the particular way in which it is done at Ramsgate, at Brighton, at Dover, and many other places—viz., by sinking a well and driving adits, in order to intercept the streams which were in the fissures of the chalk; in fact, we were obtaining the rainfall after it had percolated in some way or other through the chalk. It is well known that the water of the chalk stratum, as regards purity, stands at the very top of the list of waters. Originally the works were at a place called Southwood, and there we had two wells, with tunnels connecting them, and for 20 years those works supplied the town with water. In 1855, in consequence partly of an unusual drought of water, and from the fact that we were drawing a good deal upon those wells, there was an infiltration of salt water, and it became necessary to construct new works, and then the company bought the land at Whitehall, and constructed the works from which they now derive almost their entire supply. The same plan was adopted there; wells were sunk, and tunnels driven towards the sea coast, and those tunnels have been extended from time to time as we wanted water. We have gradually gone on from one length to another till we have attained a total length of 2687 feet. The depth below the surface at Whitehall is 104 feet, and at Southwood between 170 and 180 feet. The water rises in the wells from 11 to 13 feet above the bottom. Of course, there is a limit to the amount you can obtain from a certain body of chalk, but practically, for the supply of such a place as Ramsgate, the supply is only limited by the extent to which you can drive your tunnels. In 1855 we were lowering the wells very considerably, and then the salt water came in. When we stopped pumping from those works the water began to improve, and at the present time, so long as we do not draw the water below a certain level, and so long as we do not keep it down to that level for too long a time, the water at Southwood is just as good as that at Whitehall. I should say we have hitherto used Southwood simply as a stand-by in case of a breakdown of the machinery, or a shortness of water at the other place, which at present we have not experienced. So far as I know, there is no fear of any sewage contamination in our wells. Up to 1851 the company had expended £15,000, and all the money expended upon works since that date has been so done under my direction. For several years it has been a matter of consultation between the directors and myself as to putting up a new engine in place of one which had been in use for many years, and just about the time of last year's committee I received orders to erect that engine, which has been done at an expense of £5000 in round figures, and a new well has been sunk at Whitehall for the purpose of ensuring a supply for many years to come. In addition arrangements have been made with the owners of some adjoining land, to enable an adit to be driven further into the country, and also cross adits under that land for the purpose of getting more water out of the chalk. At present our storeage capacity is a covered reservoir capable of holding 650,000 gallons. I estimate the new works and necessary expenses will amount to about £15,000; and looking forward to an extension of mains, I do not think it would be safe to ask for less than £20,000 additional capital. The quantity of water we pumped last August was equal to 18 gallons per head for the 20,000 inhabitants, and 10 gallons per head for 13,000 visitors, which amounts in all to 500,000 gallons per day. In taking 18, or 20, or 25 gallons per head, we have always to take into account the amount of water which is wasted. That is a permanent quantity, and, unfortunately, engineers cannot prevent it. The real fact is that there do not go more than from 12 to 15 gallons per head per day through the service. At Brighton, where the supply is about one-third constant and two-thirds intermittent, we use, when the town is full of visitors, between 19 and 20 gallons per head. At Hastings the supply is about 18 gallons per head during the off season, but only about 12 gallons per head during the extra season. At Deal the supply is 15 gallons per head. The new engine was started at the early part of the present week; it will lift, at its ordinary speed, 48,000 gallons an hour, or in eleven hours the 500,000 gallons mentioned. We have, therefore, two engines at Whitehall now, each able to pump 500,000 gallons a day. If we put the whole of the pumping power to work, it would be equivalent to 1,700,000 or 1,800,000 gallons, and I have no doubt we shall be able to supply that quantity at least, under the arrangements we have made with the landowners. Taking into account that we make no charge for water-closets, the price at Ramsgate is less than in the average of towns in Great Britain, and about the same with respect to towns under similar circumstances—drawing water from the chalk. In my opinion, the consumers have been benefited through the company not previously applying for an Act to authorize them to raise a large amount of capital. If we had applied in 1855, there is no doubt we should have obtained an Act with the incorporation of the Water-Works Clauses Act of 1847, which gave a dividend of 10 per cent.

Mr. MICHAEL: If you had been under the operation of the Water-Works Clauses Act of 1847, and had earned profits sufficient to pay the 10 per cent. allowed by that Act, the company would have received £9322 more

than they have received, or than they seek to capitalize now, under the provisions of the Bill before the committee?

Witness: Certainly. There would have been also, under the Act of 1855, a borrowing power, which in those days was generally one-third of the capital raised—but which is now one-fourth—which would have been either £5000 or £3750, and that money would have enabled us, with the £15,000 which we should have raised, to have carried on our works to the end of 1875. We have since expended £5000 upon the new engine, &c., and have engaged to pay £1000 for the privilege of tunnelling under the new land, and to that must be added the costs of these proceedings, both last year and this. The Stockport Company raised £100,000 in 1861 under the Water-Works Clauses Act of 1847, and £50,000 in 1864, under the same Act. The Sutton Company also raised £20,000 in 1863, and £40,000 in 1871; Spalding raised £8000 in 1860, and £5000 in 1869; Falmouth raised £10,000 in 1847, and £10,000 in 1862; Lewes raised £6000 in 1833, and £13,000 in 1868. The only restrictions put in any of those Acts were those provided by the Act of 1847. I have not heard anything in the course of these proceedings which shows any *laches* on the part of the company with reference to the inspection of the fittings. It is not the business of the company—although they do it very often—to look after the fittings in the houses in respect of contamination, and so forth. The company have done all they could to keep the water pure, so far as the powers of their Act allowed them to go. We now seek power to give a constant supply, and we propose to insert in the Bill certain regulations, which have been very carefully drawn up by Mr. Bramwell and myself. In making those regulations the local board of Ramsgate would have a most powerful voice, because the Local Government Board would never authorize any regulations unless they had been discussed at a local inquiry. A most exhaustive inquiry was made last year in the matter of the Portsmouth Regulations, when the Portsmouth Corporation appeared before Dr. Pole, the arbitrator, and the whole question was threshed out in detail, in a sitting of many days, and the result was a code of regulations very much like that we have appended to the present Bill. Whatever regulations are made, there will be sure to be some difficulty in keeping the fittings in the poorer houses intact, but it will not be so much as some people imagine. The local board have ample power, under the provisions of the Public Health Act of 1875, to do what is necessary to ensure the health of the town.

Cross-examined by Mr. VENABLES: With the exception of Stockport, I have been engineer to all the companies I have mentioned. There is only one company with which I am connected, in which a limitation has been introduced into the Act, and that is the Brighton Company, and that limitation was put in under very peculiar circumstances. The works were originally started about a year before the Ramsgate works. Their Act was passed in 1834, and the original capital was £47,500. In 1853 a Bill was obtained by a new company—with which I was connected—for supplying the town with water in opposition to the existing company. The capital of the new company was £60,000, with a borrowing power of £20,000. The plea upon which the new company applied to Parliament was that the old company were supplying the place very badly, and that they did not supply half the population. We also said that we were going to give a constant service; and it was from those things combined that we succeeded. The old company, rather than compete with us, offered to sell, and in the next year, 1854, we bought them up for £92,500, or about double their original capital, and we then applied for an Act to raise £130,000 to buy up that company and to extend the works. We also asked for power to give an intermittent, instead of a constant, supply, but were opposed by the corporation, who were successful in striking out the clauses relating to the intermittent supply. At the same time the committee limited us to 8 per cent. on our capital of £130,000. In 1865, as Brighton increased, we wanted more capital, and obtained power to raise £80,000 additional, but still under the same limit of 8 per cent.

Mr. VENABLES: I admit there are some cases in which 10 per cent. has been authorized since 1860, but, from your general knowledge, should you not say that the amount authorized at 7 per cent. or a lower rate must have been much larger than that authorized at 10 per cent.?

Witness: I should say it has been the policy of Parliament since the years 1862, 1863, or 1864, to limit the dividend upon the extra stock. But it was not so in 1855, when the Ramsgate Company ought to have applied for more capital. We expended very little capital between 1867 and 1870, but in that year we spent £6000; in 1871, £7000; in 1872, £9000; in 1873, £10,000; in 1874, 12,000; in 1875, £15,000. I maintain that the consumers were saved a good deal of money by our adopting the course we did, as compared with what they would have had to pay if we had applied to Parliament sooner. The object with which our works were made was to take the adits parallel to the sea-shore, and to intercept the stream flowing through the chalk into the sea. The reason I advised to acquire the new land was that I desired in future tunnelling to go farther from the sea. The new adit would, first of all, go northwards, and would be a sort of culvert to bring down the water we should get from the new land.

Mr. VENABLES: Then it looks to me as if you would be getting the same water before it comes into your present adits?

Witness: No; because our present adits extend to the eastward. We should have almost all the land to the west of the railway for new ground; and besides that, we do not get the whole of that water which falls upon the chalk, by means of these intercepting adits. I know we can get more water by the adits that we have driven parallel to one another within a distance of about three-quarters of a mile. The works of the Brighton Company were transferred to the corporation in 1871, and I am now the engineer to the corporation. The circumstances of the transfer were these:—Owing to unfortunate private matters of my own, I was not giving, perhaps, the attention to the business that I ought to have done, and a breakdown took place in the machinery, in consequence of which the upper parts of Brighton were left without water, and there was a great outcry. The corporation had always been trying to catch us napping, and they took the opportunity to put on the screw, and frightened the directors so that they agreed to sell straight off. The corporation undertook all the debts of the company, and gave up the reserve-fund of £6000, which was divided amongst the shareholders. The £10 shares were then paying 7 per cent., and the company got the maximum dividend of 8 per cent., capitalized at 20 years purchase. The Brighton Corporation have just expended £35,000 in extending their works. I think the town is better off as regards the supply of water, because the corporation are making the profits which the company would have made; but I do not think the local board of Ramsgate have shown the same aptitude for taking over works of this description, and managing them, as the people at Brighton did, or as the people of Birmingham have done. I believe it is quite true, as has been stated, that the company have always been in advance of the local authority in sanitary matters. Then, again, the advantage in the matter of laying on fresh services to houses would not attain the importance here that it did in the other two cases—and Birmingham especially—because we are now supplying some 3940 houses, out of 4000 in the whole of Ramsgate. I remember the evidence given by Mr. Ellice-Clark, and the medical officer, about the great grievances which had been suffered for want of water, and it is a pity those grievances had not been mentioned to the company formally, as they ought to have been. With regard to the number of water-closets having no supply of water, that is one of the points on which the local board have shown a great want of supervision over sanitary matters. With regard to the Stockton case of last year, the water company did not appear before the committee with clean hands. We proved in that case that they had not the water which they ought to have had, and, after being told by the committee that they ought to go to another source, they persisted in going to the old source, which had been rejected by the committee before. The two cases are not in the slightest degree parallel to one another.

Mr. VENABLES: But your evidence was to the effect that it would be for the public good, on grounds quite unconnected with the special case of Stockton, that the corporation should have the supply?

Witness: Yes; and I say so again. My opinion is the same upon the general principle, that it is for the advantage of communities that the corporations should have the water-works.

Cross-examined by Mr. WILLIAMS: Under the Bill of the company we have no power of going to Minster, and I should not go there if we had. It would be more difficult to get water there than at Ramsgate, and I have reason to think it is not such good water there. We have had it for a long time under contemplation to give a constant supply, and we should like to do it.

Mr. WILLIAMS: That is exactly what we complain of about your company—they always have so many things in contemplation, and never do them.

Witness: The reason is that it is impossible to do them. When we write to the local board to ask their assistance in bringing in a Bill to give us the power which is absolutely necessary to give a constant supply, and also to readjust our capital—for that is necessary as well—then they apply for a Bill themselves. I am aware that some correspondence passed between Mr. Wastall, of Queen Street, and the company, in reference to a constant supply, in consequence of the firm with which that gentleman was connected having erected one of Rowbottom's patent water-engines, but the directors were unable to comply with that request.

Mr. POPE said the constant supply had been granted during the present year.

Cross-examination resumed: In my judgment the people of Hove are very well off under the supply given them by the Corporation of Brighton. I am also aware that there is a petition from certain ratepayers in St. Lawrence, in which they state substantially that they are of opinion that the company can do for them better than the Ramsgate Local Board.

Mr. WILLIAMS: Will you tell me how you distinguish between the people of St. Lawrence and the people of Hove, and why, when the people of Hove are well off under the Brighton Corporation, the ratepayers of St. Lawrence will not be well off under the Ramsgate Local Board?

Witness: Because the Corporation of Brighton have always distinguished themselves by being foremost in all matters which would improve the sanitary condition, &c., of their town; and they have wisely, in my opinion, carried out the principles and the policy of the water company which had the works before them.

Re-examined by Mr. MICHAEL: In these matters every individual case must be judged upon its own merits. In the case of Birmingham there were hundreds of houses supplied with water from surface wells, which was an abomination, and the corporation had found it impossible to close those wells, and evidence was given as to the necessity for the transfer of the water-works in order to remove the excessive mortality resulting from that state of things, but there are no such circumstances in the present case. As to the question of profits, supposing what has been shadowed forth by the local board were carried out, I think it would result in an increase of the rates; there would be no profits. I do not think there is much inclination to purchase the works of companies which are not paying. Under the 51st and following sections of the Public Health Act a local board have the power to enforce from a company a proper and reasonable supply of pure and wholesome water for sanitary purposes, and if it is not given, after a procedure which is there laid down, the board have power to provide water-works of their own. The Ramsgate Local Board actually commenced proceedings under those sections by giving the company notice, and asking if they were able and willing to give such a supply. By the present Bill we ask for powers to make regulations which shall enforce continuously the carrying out of that which the local board say is necessary, and those powers we must have, otherwise we cannot give a constant supply, nor can the board themselves. If we obtain our Bill we shall be able to erect works sufficient to supply at least 20 per cent. more population than there is now in Ramsgate.

Mr. VENABLES read various extracts from the Public Health Act of 1875, and said his contention was that the local board had no power to supply water from the works of the company, but merely to call upon the company to do it.

Mr. MICHAEL said the Act provided that if the company were not able and willing to give a proper and sufficient supply of water, there was to be an arbitration to determine any difference, and to regulate the supply; and in the case of the company then failing to give the supply as directed, then the local board could construct water-works of their own.

Mr. VENABLES: But then they could only apply that water to sanitary purposes.

Mr. MICHAEL said that was not so; they would have all the powers of a water company. The Act of 1875 was expressly passed because there was a great *lacuna* in the other Sanitary Acts, and the Public Health Act incorporated all the clauses of the Water-Works Clauses Act, and placed a local board in the same position as a water company, giving them the same rights and immunities, and clothing them with every power to make rates and collect rents.

Mr. BONHAM-CARTER: How about the position of the consumer under the provisions of your Bill before the committee?

Witness: We asked in our Bill for £19,000 of improvement stock, but Lord Redesdale reduced that to £15,000, with 5 per cent. interest, instead of 6 per cent. We shall still be entitled to pay back dividends upon the £15,000 up to 10 per cent., having the Water-Works Clauses Act incorporated. That is £1500 a year; and there will be the £15,000 which Lord Redesdale gives us at 5 per cent.—that would be £750 a year. Then we are asking for £20,000, which is to be expended in prospective works to meet the increasing wants of the district, some of which we shall have to call up immediately; but we do not suppose we shall get 10 per cent. upon that—we have reckoned 7 per cent. Under our present Act we can pay any dividend we like, and so long as we are not charging the consumers more than is charged as the average of other places, and so long as we are doing our duty, I cannot see why we should not divide what is earned.

By Mr. LEIGH: Calculating the population at 22,000, and the cost of the works at £30,000, that would be something under 30s. per head of the population, and I need not say that is a small amount for capital spent upon water-works.

By the COMMITTEE: With reference to the evidence given by Mr. Latham, that he never knew more than 300,000 gallons per day to be given off a chalk area at the minimum period, so that if the area was 2½ square miles, it would not be possible to obtain more than 750,000 gallons of water in 24 hours, I must confess I was not able to follow that gentleman in his calculations. On the contrary, my experience at Brighton—which is a very large one—is different; and the matter has been

most thoroughly investigated by me, for I read a paper at the British Association on the Brighton Water-Works, and another before the Institute of Mechanical Engineers, and the result of those investigations was totally different to Mr. Latham's. The adits are on the same level, because you go under the water and collect it, and the adits form underground reservoirs. On the average at Brighton they are about 8 feet 6 inches by 4 feet 6 inches, and they hold very nearly 500,000 gallons when they are full.

Mr. *E. Syrett*, Mr. *J. Hake*, and Mr. *G. Wilson* gave evidence confirmatory of that of previous witnesses with reference to the satisfactory supply of both gas and water. In the course of the examination of Mr. Hake, he stated that he had been deputy-superintendent and superintendent of the Ramsgate Fire Brigade for nine years, and always found a sufficient supply of water, and the fires averaged nine or ten in the year.

Mr. *H. E. Jones*, examined by Mr. MICHAEL.

I am a member of the Institution of Civil Engineers, and engineer to the Commercial Gas Company. I have been consulting engineer to the Isle of Thanet Gas Company for about two years, but my father, with whom I worked, was consulting engineer before that time for a period of some 10 or 11 years. The business of the Ramsgate Company extends itself at something like 8 per cent. per annum, and the works have been carried out in that proportion to meet the increased supply. The works both at Ramsgate and Margate have been for the most part remodelled during the last 15 years. The mode of conducting the business there is such as to ensure the best kind of gas. At both the stations the company have something like 40 per cent. more retorts and more carbonizing power than they have full employment for, even in the depth of winter. The purifying plant, both for removing ammonia and sulphur, is in every respect what it ought to be. They have, in fact, all the modern appliances for producing gas efficiently and economically. The unaccounted-for gas is under 10 per cent., and that is a very low average, seeing that the works are separate, and that each station has a frontage of its own, on what may be called outlying and unremunerative districts. The pressure on both towns varies at night from 15-10ths to 16-10ths of an inch of water, and in the daytime it is something like 8-10ths of an inch. The pressure inserted in all modern gas Acts is from sunset to midnight 8-10ths, and from midnight to sunset 6-10ths, so that we have been practically giving double the quantity demanded by modern legislation. The reason why we put on that pressure is that many of the fittings in the houses are very old fashioned, and that small lights have been added without a reconstruction of the internal fittings. The fittings also become corroded, and then we have complaints from the consumers about not having enough light, but when we go to attend to those complaints we find ourselves quite helpless, because we can only suggest that an alteration should be made in the fittings. That, however, costs money, which the consumer does not care to spend, and the complaint is allowed to go unremedied, but that is not peculiar to Ramsgate. The illuminating power has been, on an average, something like 14 candles. The company have always employed the best Newcastle coal, and that, unless thoroughly mismanaged, will yield a gas of that quality. We have a continuous test for sulphur at both works; at Margate we have a jet photometer, and at Ramsgate a jet, and also a Bunsen photometer. The sulphur has been kept down to something like 30 grains per 100 feet. Of course we extract the ammonia from the gas, because that is a valuable product to sell. The price of gas at both places has been very low, with the exception of the two years of the coal famine. Before that time they were charging 4s., while two London companies were charging more, and it is much more profitable to supply gas in London than in a town like Ramsgate. The price obtainable for coke has not been remunerative. Coke regulates the price of gas perhaps more than the price of coal; and in towns like Ramsgate and Margate, where there is no trade or manufacture whatever, it is always a drug. It accumulates on our hands sometimes in mild winters, and we do not know what to do with it. It will, sooner or later, come to giving it away, rather than letting it lie. Comparing the price of gas with that of neighbouring towns, I find that while we have been charging 4s., Dover has been charging 4s. 3d., Folkestone 4s. 9d. and 4s. 6d., Eastbourne 5s., and Hastings 4s. 7d. and 4s. 5d. The reason we have charged less was that we have been taking such a small amount out of the price of gas for the shareholders profit. I should think the works represent a capital outlay of £85,000, and the charge upon the gas for profit has only been £2400 a year. I have no doubt but that in the future there will be an increase of consumption, requiring an increase of capital upon the works, and I think the amount inserted in the company's Bill is hardly enough. I do not think the money the company have asked for will carry them on anything like eight or nine years. Placing this company on all fours with others, I assume the company would have had something like £50,000 at 10 per cent., and £35,000 at 7 per cent., and the dividend upon those amounts would have been £7450 a year, which the shareholders would have been entitled to receive.

Mr. MICHAEL: You know the works of the company well, could they have been constructed for a less sum than from £80,000 to £85,000?

Witness: No. Mr. Stevenson stated that he would allow for such works from £600 to £700 per million cubic feet of their annual productive power. They are absolutely making 110 millions, and they are competent to make in most particulars something like 140 millions.

Cross-examined by Mr. BIDDER: I have not been engaged in the management of the gas-works, but in advising the directors upon extensions and alterations of the works. I have heard the late Dr. Letheby say that a proportion of ammonia being left in the gas was rather serviceable, but it is removed because it is very profitable to do so. There is no difference between the illuminating power of the gas at the works and that at the burner. Previously to our having the Bunsen photometer, we had an inferential photometer, which gives the illuminating power by the indication of the height of the flame. It does not state the definite quality, but it does so approximately, and with very great delicacy; it is not affected by any deviations. When the manager has once ascertained that his gas is satisfactory with the jet at a certain height, if he keeps the jet at that thereafter he is safe.

Mr. BIDDER: Does not the result of the illuminating power derived from the inferential photometer depend to a great extent upon the pressure with which the gas is forced through the instrument?

Witness: It does not, because without you look at the pressure to start with it is no use attempting the experiment at all. If you increase the pressure you get a different result, and the whole thing is worthless.

Mr. BIDDER: That is the very thing I am trying to arrive at—that the whole thing is worthless.

Witness: You cannot improve the illuminating power by putting on the pressure.

Mr. BIDDER: If the pressure is greater at the works, the result would indicate a greater illuminating power, and if it was less, it would indicate a less illuminating power?

Witness: I cannot tell you that. Your question is put as if you did not understand the instrument at all.

Mr. BIDDER: I do not understand it.

Witness: Then you had better not ask me such a question as that.

Mr. BIDDER: I am instructed that if the pressure at which the gas is forced through the instrument is increased, the result in illuminating power indicated is also increased?

Witness: No; you get a longer flare, if that is what you mean, but no one would pretend to call that any indication of the illuminating power. The return from the photometer is always taken with the pressure relative to the height of the flame; the two things are always taken into account. I believe the report of the illuminating power has been kept in the manager's carbonizing book.

Mr. BIDDER: Why is it necessary in your case to have a pressure which is double that which is prescribed by modern Acts?

Witness: Because in nine out of ten houses the apparatus is not in good order, and, although at considerable loss, we are obliged to put on this heavier pressure.

Mr. BIDDER: Is there not another cause—viz., that the mains are too small?

Witness: The best proof that the mains are not very small is that we get this pressure all over the district, with a very little loss from the initial pressure that we employ at the works. Of course those consumers whose fittings are good have too much pressure, but they have their taps to reduce it. The pressure has been tested at various points, and the observations have been recorded by the manager of the works.

Mr. BIDDER objected to the evidence of the witness being received, and submitted that the manager himself ought to be called.

The CHAIRMAN said he thought they ought to have the evidence of the gentleman who made the observations.

Mr. MICHAEL said that the manager might not have made the observations himself, and it would therefore be necessary to call the men who did so.

The CHAIRMAN said the committee would receive the evidence for what it was worth. They might look upon it that the witness produced the record which was kept at the works.

Mr. BIDDER submitted that it was not evidence at all.

Mr. MICHAEL said that no questions had been asked of Messrs. Stevenson and Penny, the engineers who had been examined for the local board, as to the purity and illuminating power of the gas, and all they had had was the loose statements of a photographer who tested gas for sulphuretted hydrogen by nitrate of silver in daylight, and the gentleman who exhibited photometers in his shop-window.

After some further discussion,

Mr. MICHAEL said he would settle the question by undertaking to call the manager of the Ramsgate works on the following day.

Mr. BIDDER (to witness): Do you see any objection, supposing the Bill were to pass, to put up to auction the new capital, and introduce what are called the auction clauses?

Witness: I do not think it is fair to deprive the shareholders of all interest in the extension of their business. I do not see why you should appropriate such a thing in a gas company any more than in a railway company.

Mr. BIDDER: You think that the gentlemen who originally found the £16,000 should not only have their 10 per cent., and then 5 per cent. on the capitalized profits, but that they should have the right *ad infinitum* to invest money at a good per centage in extensions for the future?

Witness: Yes, distinctly, always taking the risks of the trade. My proposal, as to the interest the company should have for any extension of capital, is 7 per cent., and, doubtless, those 7 per cent. shares would realize a considerable premium. I do not know of a gas company since 1865 being allowed 10 per cent. on capitalized profits.

Mr. MICHAEL: We only ask for 5 per cent. on the capitalized profits, and 7 per cent. on the new capital.

Mr. BIDDER: You ask for £24,000 at 10 per cent.

Mr. MICHAEL: That is old capital.

Mr. BIDDER: But £8000 of that is capitalized profits. You never found more than £16,000 in money, and you are asking for 10 per cent. upon that.

By the COMMITTEE: When I said that no company out of London were bound by the sulphur clause, I was speaking generally. I believe they are so at Newcastle, and I rather think at Birmingham.

(To be continued.)

Legal Intelligence.

HIGH COURT OF JUSTICE—CHANCERY DIVISION.

TUESDAY, APRIL 10.

(Before Vice-Chancellor MALINS.*)*

BRÖNNER *v.* HUNTBACH.

Mr. GLASSE, Q.C., Mr. HIGGINS, Q.C., and Mr. ROMER appeared for the plaintiff, and Mr. PEARSON, Q.C., and Mr. HUMPHRIES for the defendant.

The plaintiff in this case, through his agents, Messrs. Greene and Son, of Cannon Street, London, applied for an injunction to restrain the defendant, who resides at Manchester, from advertising or offering for sale as Brönner's burners, any gas-burners not manufactured by the plaintiff, and also from selling any gas-burner not manufactured by the plaintiff, having any colourable imitation of the plaintiff's trade mark, "Brönner's Patent." It appeared that the defendant had bought the gas-burners in question from one Julius Ungar, against whom the Vice-Chancellor had already granted an injunction.

The VICE-CHANCELLOR granted a perpetual injunction as prayed.

QUEEN'S BENCH DIVISION.

TUESDAY, APRIL 17.

(Before Justices MELLOR *and* MANISTY.*)*

REGINA *v.* THE COLNE VALLEY GAS COMPANY, LIMITED.

Mr. WILLS said this was an indictment tried at the last Leeds Assizes before Lord Coleridge, when the jury returned a verdict of guilty. He now moved for a rule *nisi*, calling upon the prosecution to show cause why there should not be a new trial on the ground of misdirection. The defendants were a company without an Act of Parliament. The indictment was preferred against them by another gas company, formed under an Act of Parliament in the same district. The defendants were indicted for an obstruction in breaking certain roads and streets for laying down their pipes. Three instances of obstruction were proved, but they were very slight. The work commenced at eleven o'clock, and was concluded at three o'clock in the morning. No one saw them at work but the police, in two of the three instances—one when the policeman had to diverge and walk round the works, and the third obstruction was caused by the prosecution sending a body of men to prevent the defendants men from proceeding with their work.

The Court granted a rule.

COMMON PLEAS DIVISION.

THURSDAY, APRIL 19.

(Before Justice DENMAN *and a Common Jury.)*

CROWTHER AND ANOTHER *v.* STREET.

This was an action to recover £88 6s. for making surveys and preparing plans in connexion with the Beverley Water Bill, 1874.

Mr. FRENCH said that the plaintiffs (Messrs. Crowther) were surveyors, and the defendant was described as the promoter of the Beverley Water Bill, which failed to pass through Parliament. In November, 1873, in compliance with the report of Messrs. Hawksley, Mr. George Crowther, a member of the plaintiffs firm, proceeded to Beverley, where he received instructions from Messrs. Robinson, solicitors and local agents to the scheme, to make surveys and prepare plans of the district for the purposes of the Bill. Messrs. Robinson showed him the general outline of the scheme, and desired him to survey the neighbourhood where the works were intended to be constructed, and also to take levels for a distance of about three miles, so as to get a sufficient elevation from which the water could be supplied by gravitation. He did all this, and prepared the plans in time to be deposited by the 30th of November, in compliance with the parliamentary Standing Orders. His charge for the work performed was £70, and the remaining £18 6s. was money actually out of pocket in railway fare, travelling, &c. He had since claimed payment, but the money was not forthcoming.

Plaintiff having given evidence in support of the learned counsel's statement, the jury returned a verdict for the sum sued for, the defendant not appearing.

Judgment for the plaintiffs.

BIRMINGHAM POLICE COURT.—THURSDAY, APRIL 12.
(*Before Mr.* KYNNERSLY, *the Stipendiary, and other Magistrates.*)

CONVICTION FOR GAS-STEALING.

William Scattergood, lamplighter, Herbert Road, was summoned, at the instance of the Corporation of Birmingham, for having, on the 24th ult., fraudulently abstracted gas, for having unlawfully connected a pipe with his meter without having given 24 hours notice of his intention, and for having unlawfully prevented his meter from duly registering the quantity of gas supplied.

Defendant pleaded guilty.

Mr. JESSE HERBERT, who appeared to prosecute, said that three summonses had been issued against the defendant, but there was virtually but one offence. Defendant was a lamplighter in the employment of the corporation, and was a consumer of gas. He had connected a pipe with the main in such a way that the gas was not registered in the meter, and he had also joined another pipe in such a way that the gas was burnt direct from the main. Mr. Herbert did not press for the full penalty on all three charges, which would have amounted to £9, inasmuch as the defendant had long been a servant of the corporation, and had discharged his duties faithfully and well. Something, however, must be done to prevent this practice, which was now getting common.

The MAGISTRATES ordered the defendant to pay a fine of £5 and costs, on the charge of fraudulently abstracting. They remarked that defendant had used the knowledge which he possessed, as a servant of the corporation, for an improper purpose, and they had, therefore, notwithstanding the recommendation of the prosecution, no alternative but to treat it as a very serious offence.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

BERMONDSEY VESTRY.

At the last meeting of the Vestry—Mr. G. ELKINGTON, the surveyor, presented the following report on the supply of gas to the public lamps:—

To the Vestry of Bermondsey.

Gentlemen,—In compliance with the resolution of the Vestry passed on the 5th of March last, I beg to submit the following report with reference to the means of obtaining a better supply of gas to the public lamps:—

The parish is now lighted by three companies, the number of lamps in their respective districts being as follows:—

Phœnix Gas Company	64
South Metropolitan Gas Company	240
Surrey Consumers Gas Company	504
	808

When the Metropolis Local Management Act came into operation in January, 1856, the greater part of the district was supplied by the Surrey Consumers Gas Company under a contract, dated Oct. 7, 1851, entered into with the Commissioners of Bermondsey Improvements, the leading provisions of which, relating to the supply of gas were thus stated:

"To supply a sufficient quantity of proper gas, such gas to be pure carburetted hydrogen, free from sulphur and ammonia."

"Each burner to consume 5 feet of gas per hour, at least, with a 4-inch width of flame, and shall, in all respects, give as good and brilliant a light as those supplied by the South Metropolitan Gas Company, and as any other lamps that now are or may at any time hereafter be supplied in any parish of the Metropolis."

"That every branch and service-pipe used for such lighting shall be kept fully charged with gas, and the stopcocks so turned on as not to impede or prevent any such branch or service-pipe being filled with gas."

"To trim, clean, and light."

"To clean once in every week the lamps and lanterns."

"To paint once in every year."

"To forfeit and pay 10s. for every occasion on which such lamp shall be found so not lighted or remaining extinguished or burning with less illuminating power than ought to be, provided that the company shall not be liable to pay such sums in cases when the causes of failure shall be beyond the control of the company, their agents or servants."

"The price paid £4 per lamp per annum."

This arrangement continued in force until the year 1861, when fresh contracts were entered into by the vestry with each of the three companies for a period of seven years up to Midsummer, 1868, unless determined by either party at six months notice, the principal provisions thereof relating to the supply of gas being varied from the previous contract in several respects, and being thus stated:

"To provide and supply to all the public lamps a sufficient quantity of pure gas."

"To provide and lay all such lamps, burners, lamp-posts, brackets, also all such mains, pipes, syphons, and other apparatus as shall be necessary for the purposes of the said gas supply, and to keep the same in good repair and working order."

"To set light to and extinguish all the lamps."

"To cleanse and keep properly cleansed all the said lamps."

"To paint once in every year."

"The burners to be either bat's-wing or fishtail burners, made so as to consume 5 cubic feet of gas in every hour."

"The illuminating power to be such as required by the Metropolis Gas Act, 1860."

"To forfeit and pay 6d. for every occasion on which such lamp shall be found so not lighted or remaining extinguished, or burning with less illuminating power than ought to be, provided that the company shall not be liable to pay such sums in cases when the causes of failure shall be beyond the control of the company, their agents or servants."

"That the mains and service-pipes shall be kept regularly cleansed and freed from all stoppage and obstruction, and that all stoppages, obstructions, and defects in any mains or service-pipes or other apparatus for supplying gas shall be removed or remedied within twelve hours after the same shall have been discovered or made known to the company or their servants."

"The price paid £4 5s. per lamp per annum."

The contracts with each of the three companies remained in force until Midsummer, 1868, since which date no new contract has been entered into, the parish being supplied by them respectively on the same terms, with the exception of the South Metropolitan Gas Company, who voluntarily allowed a discount of 12½ per cent. for a considerable period, and who allow at the present moment a discount of 7½ per cent.

On comparing the terms of the two contracts, it will be noticed that those of 1861 were less stringent than the conditions of the previous contract in 1851, especially as to the amount of penalty, but as it was urged that the provisions of the Metropolis Gas Act, 1860, would operate as a sufficient protection to all local authorities, I beg to direct your attention to the five clauses which specially refer to the matter, viz:—

"*Metropolis Gas Act*, 1860.

"7.—If at any time complaints as to the quantity or quality of the gas supplied by any company be made to the said Secretary of State, by memorial in writing, from the Metropolitan Board of Works, or any Vestry or District Board of Works, signed by their clerks respectively, or not less than 20 inhabitant householders paying rates for, and supplied with, gas by any such company, it shall be lawful for the said Secretary, at any time within one month after the receipt of such complaint, to appoint a competent person as inspector, to inquire into and concerning the grounds of such complaint, and to report to the Secretary thereon."

"22.—The gas company shall well and effectually light all public lamps in all streets which they are required by the local authority to light; and shall, according to the terms of their contract, supply to the local authority so much gas as they require for their public lamps, provided that the gas company shall not be compelled to light any street with lamps at a greater distance from each other than 75 yards.

"23.—The local authority may provide and keep in repair their own public lamp-posts and lamps, and apparatus connected therewith, and, in case of their electing to burn by meter, light and extinguish the lamps, and defray the expenses thereof.

"24.—Every gas company shall, unless prevented by necessary repairs or unavoidable accident, at all times keep all their branch or service pipes fully charged with gas, and the stopcocks so turned as not to prevent the branch or service pipes from being at all times filled with gas.

"37.—The gas company shall not charge a higher price, by the one thousand cubic feet, for gas supplied to any local authority, than the lowest rate, by the one thousand cubic feet, from time to time charged by them to any private consumers, otherwise than by special contract in writing, in the district supplied by the gas company."

For the information of the vestry I have ascertained the prices paid in certain other districts, viz.:—

Rotherhithe	£4	5	0	The Surrey Consumers Co. light, clean, paint, and repair.
St. George's Southwark . .	4	5	0	The Phœnix Gas Co., ditto.
Ditto ditto . .	4	4	0	South Metropolitan Gas Co. less 7½ per cent. discount, ditto.
Ditto ditto . .	4	14	9	London Gas Co., ditto
St. Olave's Board of Works.	4	5	0	Surrey Consumers Gas Co., the lighting, cleaning, repairing, and painting carried out by the St. Olave's Board of Works.
Lewisham Board of Works .	4	12	0	Phœnix Gas Co. light, clean, paint, and repair.
Ditto ditto .	4	3	4	Crystal Palace Gas Co., ditto.

As regards the manner in which the several companies have performed their respective contracts, the Vestry have not received any complaints of the Phœnix or South Metropolitan Gas Companies, who fairly and efficiently supply their districts, and fulfil the obligations imposed by Act of Parliament.

The supply of gas, however, to the public lamps on the part of the Surrey Consumers Gas Company is most unsatisfactory and inefficient, complaints of a diminished quality of light having been repeatedly made to the vestry for years past, and the representations made to the company in consequence having been treated with disregard or indifference. It is to be regretted that this company, originally established, after much public agitation, in the express interests of consumers, should now abuse its monopoly by ignoring those interests, and charging a higher rate than other districts.

I assume it to be well established that every public lamp should be enabled to burn 5 cubic feet of gas per hour, and I believe the fact to be notorious that such is not the case, arising either from instructions issued to the company's men not to turn on the burners to the full extent, or from defective services and apparatus. There is, in my opinion, a most serious want of supervision in dealing with the necessary details connected with the lamps, whether as respects the services, the reinstatement or renewal of burners, the cleaning, mode of fixing, the manner of turning on, and other items which it is the duty of the company to carry out. Complaints have also been numerous, as to the hours of lighting and extinguishing the lamps. The number of cubic feet which ought to be consumed annually at each lamp, if lighted from sunset to sunrise, is 21,900.

With reference to the means of obtaining a better supply in accordance with the vestry's resolution, the question must be dealt with on two grounds—quality and quantity.

First as to Quality.—By the provisions of the Metropolis Gas Act, the vestry are authorized (if not indeed required) to construct a testing-room, and to appoint a chemical examiner or gas engineer. The proposal to do so in Bermondsey was negatived by the vestry on a former occasion, but it is obvious that the vestry are entirely precluded from taking any action to ensure the illuminating power being such as is defined by the Act, unless this course is adopted.

The St. Olave's Board of Works have complied with the Act by erecting a testing-room in Vine Street, and appointed a gas examiner (Dr. Vinen), who reports regularly the result of his observations. The entry for the week ending March 10 was

Maximum light	12·25
Minimum ,, ...	11·61
Average ,, ...	11·95
Maximum pressure	15·10ths
Minimum ,, ...	6·10ths

I respectfully submit to the vestry the propriety of reconsidering this matter, bearing in mind that it affects not only the quality, purity, and illuminating power of the gas supplied to the public lamps, but also of the gas supplied to all private consumers within the district. The policy and necessity of doing so may be influenced by a consideration of the following figures, viz.:—

1856.—559 lamps, £136,454 rateable value; one lamp to every £244 of rateable value.
1877.—808 lamps, £350,960 rateable value; one lamp to every £434 of rateable value.

As to Quantity.—I am of opinion that the most effectual means of obtaining the quantity—viz., 5 cubic feet per hour, is to follow the example of the St. Olave's Board of Works, and to take the lighting into the vestry's own hands. In the adjoining district there are 857 ordinary public lamps in addition to others in railway arches, paid for under special agreement by the railway companies. To clean, light and extinguish, and otherwise attend thereto, four men are employed at 23s. per week each. I understand that the cost per lamp amounts to 12s. 6d. per annum.

The propriety of affixing meters and paying for the gas supplied on the system of average meters has been well considered in other parts of the Metropolis, but great difference of opinion exists. I am not prepared to recommend the meter system, as I believe in our own district that the defects lay not so much in the quality and illuminating power, or in the pressure, as in the extremely imperfect burners and mode of turning on. My opinion on this is confirmed by the following extract from a report presented by another local surveyor, thus:—

"It is well known to practical men that burners set to burn 5 cubic feet per hour, unless the governors are constantly adjusted, and the burners regularly cleaned, after being in use some months pass less gas than the 5 feet per hour; indeed, it is said by the Nottingham lighting authorities that burners set to burn 5 feet per hour, from dust and other causes, do not consume, as a rule, more than 4·60 cubic feet per hour."

After giving this matter full consideration, I would recommend that the vestry determine the present arrangement with the Surrey Consumers Gas Company, with a view of entering into another contract on the expiration of that notice.

That the vestry in future employ their own men to light and extinguish the lamps, and clean, repair, and paint at their own expense.

That the vestry pay the company for gas only, at such rate as may be agreed upon, which, however, cannot be higher than the lowest rate charged to any private consumer.

April 9, 1877. (Signed) GEO. ELKINGTON, Surveyor.

The following report of the law-clerks of the vestry, in reference to recent complaints of defective supply, was also presented:—

Gentlemen,—We beg to report that we have considered the question of gas supply in conjunction with your surveyor, and, having had an opportunity of seeing his report, acquiesce in the statements therein contained so far as regards the legal position of the matter. With reference to the remedies of this vestry as against the Surrey Consumers Gas Company for not providing to the public lamps of their district within this parish gas of proper quality and in a sufficient quantity, it appears that the last contract with the company expired in 1868, but gas has ever since that time been supplied to the vestry on the terms which were then in force, so that there is now no formal agreement at all in existence between the vestry and the company, and although the gas is still supplied at the old rate, the vestry cannot enforce against the company the penalties formerly in force, in the absence of the penal clause of an agreement. Unless, therefore, a new agreement be made, recourse must be had to the statutory remedies provided by the Metropolis Gas Act of 1860.

By sections 14 and 22 of that Act, the obligation of supplying gas to the vestry for the purpose of lighting the streets is thrown upon the company supplying the district, and this they are bound to perform at a rate not exceeding the lowest rate per 1000 charged to any private consumers, except in the absence of a special agreement in their favour. The Home Secretary has power, on receipt of a memorial from the vestry (or from 20 householders paying rates for, and supplied with, such gas), to appoint an inspector to inquire into the quality and quantity of the gas supplied, and to compel the company to remove all grounds of complaint, but in order to enable the Home Secretary to deal effectually with the company, the vestry must be prepared with some specific grounds of complaint, both as to the actual deficiency in quantity, and the particulars as to the quality of gas supplied. If the gas supplied be deficient in illuminating power, or be impure, the company are liable, on conviction before a police magistrate, to a penalty of £50, and a further penalty of £10 for every day during which the offence may continue after notice in writing from the vestry; but, in order to enforce this, it is necessary that the vestry should have a Gas Examiner, with testing apparatus, for the purpose of bringing before the magistrate scientific evidence as to the illuminating power and purity of the gas so supplied.

The 27th section of the Act, which directs vestries to provide such apparatus and to appoint a Gas Examiner, is imperative, and the vestry could be compelled to carry it out.

Thus the vestry, without a contract, has two courses open—either to apply to the Home Secretary or to a magistrate, but could not hope for much good to result, in either case, without the proper scientific evidence; if, however, the vestry should deem it expedient to provide for that evidence, then the remedies could be pursued either after a fresh contract had been entered into or without any such contract.

The vestry may contract with the company for the supply to them by the company of pipes, gas, burners, meters, lamps, lamp-posts, and other apparatus, and for the repair and cleansing, and for the lighting and extinguishing thereof, in such manner and on such terms and conditions as the parties may agree, or the vestry may provide and maintain their own lamp-posts and lamps, and apparatus connected therewith, and, if they elect to burn by meter, may light and extinguish the lamps.

April 9, 1877. B. G. WILKINSON, J. HARRISON, } Vestry-Clerks.

PUBLIC LIGHTING IN THE CITY.—Mr. W. Haywood, Engineer to the Commissioners of Sewers, in his annual report states that, during the last year, tenders were received from The Gaslight and Coke Company for lighting the public lamps. The prices were £4 15s. 9d. per annum for lamps of a square shape consuming 5 cubic feet of gas per hour, and £5 for lamps of a circular shape. The difference in the cost of the two is owing to the additional expense in cleaning and maintaining the circular-shaped lanterns. These prices are the same as those charged by the company for the year 1875. The number of defective lights observed during the year was 1186, which is 39 less than in 1875. The returns are made to the Commission by the City police, and include only those lamps in which the defects in lighting are very noticeable. The inspectors again report that the lanterns are cleaned twice a week, regularly, but it would be better if they were cleaned three times a week, and even more frequently during the winter months. Meters are attached to 35 of the public lamps, and the meters show that the contract quantity of gas is given at those lamps. The district inspectors and the inspector of gas lighting are of opinion that the contract quantity is given at all of the lamps, and the gas company state that the regulators have been kept in proper condition throughout the year. The commission, however, have no power to remove these regulators to test them, excepting under certain troublesome conditions, and only where there are meters to the public lamps is there any check upon the quantity supplied. An additional resting-place and five-light lamp-post was erected on the crossing at the junction of the Thames Embankment, Blackfriars Bridge, and the western side of New Bridge Street. Bartlett's Boulevard lamps, two of which were placed at the corner of Ludgate Circus, and eight in Cannon Street, in 1874, not being approved, were removed by order of the Streets Committee in February, 1876. One of Parkman's Excelsior lamps was placed on the Holborn Viaduct Staircase, at the south-east angle of Farringdon Street. Those erected in June, 1875, on one of the five-light lamp-posts in Mansion House Street still remain there. These lamps are of one piece of blown glass, supported at their lower extremities by triangular frames fixed to the tops of the lamp-posts. Mr. Skelton was allowed to replace, at his own expense, the reflectors to the catoptric lamps in Cheapside and Moorgate Street with reflectors of improved manufacture; they are placed in the tops of the lanterns only, the sides being of glass like the ordinary square lanterns in use in London.

Dr. Whitmore's report on the illuminating power, pressure, and quality of the coal gas consumed in the parish of Marylebone during March, supplied by The Gaslight and Coke Company:—

	Illuminating Power in Sperm Candles.			Mean Pressure in Tenths of an Inch.		Mean Quanty. of Sulphur in 100 Cu. Ft.	Mean Quanty. of Ammon.in 100 Cu. Ft.	Sulphuretted Hydrogn.
	*Mean of 23 Obser.	Highest.	Lowest.	Highest.	Lowest.	Grains.	Grains.	
Gas supplied from the Fulham works . .	16·93	17·60	16·41	21·52	9·08	17·05	0·64	No trace
Gas supplied from the Beckton and Bow works	16·86	17·41	16·40	33·06	14·26	14·23	0·63	No trace
Cannel gas supplied from the Pimlico works	20·74	21·40	20·00	22·75	12·50	18·57	0·36	No trace

Mean of daily readings of barometer . . . 29·54
" " " thermometer . . . 57·44

* Each observation consists of ten readings of the photometer, at intervals of one minute.

The mean illuminating power of all the gas consumed in the parish during March was unusually high, and on no occasion did it fall below the legal standard. The gas from Fulham showed a mean light equal to 17 candles, which ranged between 16·41 and 17·60 candles; that from Beckton and Bow showed a mean also of nearly 17 candles, which ranged between 16·40 and 17·41 candles. The cannel gas from Pimlico gave a mean light equal to nearly 21 candles, which ranged between 20 and 21·40 candles. The mean amount of sulphur was less than on previous occasions, the largest amount was in the cannel gas, which was 18½ grains in the 100 cubic feet. The pressure of the gas from all the works was generally satisfactory, and on no occasion was sulphuretted hydrogen detected by the ordinary tests.

METROPOLIS WATER SUPPLY.

PUBLIC WATER SUPPLY IN THE CITY.—Mr. W. Haywood, the engineer to the Commissioners of Sewers, states that, during the past year, seven out of the 61 stand-posts erected by the commission in 1875 were removed, the houses in the courts in which they had been erected having been demolished for the extension of the Metropolitan Railway to Aldgate. One stand-post has been fixed in Roper's Buildings. The cost of maintaining these stand-posts is very large, which is attributable mainly to their being fitted with water waste-preventers, but in a degree also to the rough usage to which they are subjected. The waste-preventers are required by the water company as one of the conditions of giving the supply of water to the stand-posts. The amount paid by the commission during the year for water supply was as follows:—Supply to urinals, £592 4s. 9d.; flushing sewers, £8 10s.; street-watering, £1003 8s. 7d., washing the surfaces of courts and alleys, £167 19s. 4d.; drinking fountains, £56 7s. 11d.; stand-pipes supplied to poor neighbourhoods, £17 10s.; mortuary £7 4s. total, £1853 4s. 7d. The Medical Officer of Health having reported that the water obtained from the very ancient Aldgate Pump was unfit for human consumption, its usage was discontinued, but the pump being thought to be an exceedingly useful one, a cistern was formed beneath it, connected with the main of the New River Company. At the present time, therefore, fresh New River water can at all times be pumped up.

The Registrar-General publishes the following returns of the average daily quantity of water supplied by the London Water Companies during the month of March. According to these, 111,349,135 gallons, or 505,910 cubic mètres of water (equal to about as many *tuns* by measure, *tons* by weight), were supplied daily; or 210 gallons (95·4 decalitres) rather less than a *ton* by weight, to each house, and 29·5 gallons (13·4 decalitres) to each person, against 29·7 gallons in March, 1876.

COMPANIES.	Number of Houses, &c., supplied in Mar., 1876.	Mar., 1877.	Aver. Daily Supply of Water in Gallons* during Mar., 1876.	Mar., 1877.
Total supply	524,228	531,114	110,440,676	111,349,135
From Thames	246,396	248,645	57,420,088	56,524,124
" Lea and other Sources . .	277,832	282,469	53,020,588	54,825,011
THAMES.				
Chelsea	28,600	28,737	7,082,600	7,189,300
West Middlesex	47,709	48,962	9,255,853	9,503,913
Southwark and Vauxhall . . .	80,369	77,880	18,650,000	17,200,000
Grand Junction	36,036	37,055	10,143,935	10,569,811
Lambeth	53,682	56,011	12,287,700	12,061,100
LEA AND OTHER SOURCES.				
New River	123,992	125,070	24,699,000	24,564,000
East London	109,375	111,967	21,886,000	23,712,500
Kent	44,465	45,432	6,435,588	6,548,511

* Including that for manufactures and for various purposes other than for domestic consumption.

Note.—The return for March, 1877, as compared with that for the corresponding month of 1876, shows an increase of 6886 houses, and of 908,459 gallons of water supplied daily.

Dr. Frankland reports, as the result of his analysis of the waters supplied to the Metropolis during March, that, taking the average amount of organic impurity contained in a given volume of the Kent Company's water during the last nine years as unity, the proportional amount in an equal volume of water supplied by each of the Metropolitan Water Companies and by the Tottenham Local Board of Health was—Tottenham 0·4, Kent 1·1, Colne Valley 1·3, Lambeth 3·8, New River 3·8, Grand Junction 4·1, West Middlesex 4·2, Southwark 4·2, East London 4·2, and Chelsea 4·5. The Thames and Lea had again been in flood, and the water supplied from

these rivers by the Chelsea, West Middlesex, Southwark, Grand Junction, Lambeth, New River, and East London Companies was consequently polluted with organic matter, although not to so great an extent as in December and January last. All these companies delivered efficiently filtered water except the Southwark, which sent out slightly turbid water containing moving organisms and coloured fibres. The water supplied from artesian wells to the inner circle by the Kent Company, and to the outer circle by the Colne Valley Company and the Tottenham Local Board of Health was wholesome, bright, and palatable, and of most excellent quality for dietetic purposes. The water delivered by the Kent Company, and by the Tottenham Local Board was hard, and therefore unsuitable for washing, but that supplied by the Colne Valley Company was softened by Clark's process before delivery, whereby its hardness was reduced to less than one-fifth of the original amount, and the total solid matters from 38 to 12 parts in 100,000 parts of water. Seen through a stratum two feet deep, the Kent, Colne Valley, and Tottenham waters were clear and colourless. The remaining samples presented the following appearances—Chelsea, West Middlesex, Grand Junction, and Lambeth, clear and very slightly green; Southwark, turbid and brownish green; New River and East London, clear and very slightly yellow.

Results of Analysis expressed in Parts per 100,000.

Companies or Local Authorities.	Total Solid Matters.	Organic Carbon.	Organic Nitrogen.	Ammonia.	Nitrogen, as Nitrates and Nitrites.	Total combined Nitrogen.	Chlorine.	Total Hardness.
Inner Circle.								
Thames—								
Chelsea	30·20	·241	·023	0	·319	·342	1·55	20·3
West Middlesex	29·86	·231	·018	0	·312	·330	1·58	19·7
Southwark and Vauxhall	31·00	·219	·027	0	·311	·338	1·55	20·0
Grand Junction	31·16	·215	·025	0	·280	·305	1·55	20·3
Lambeth	32·50	·208	·019	0	·361	·380	1·70	20·9
Other Sources—								
New River	30·12	·209	·018	0	·322	·340	1·55	20·9
East London	31·80	·228	·018	0	·287	·305	1·70	21·8
Kent	38·90	·055	·007	0	·358	·365	2·35	24·8
Outer Circle.								
Colne Valley	12·30	·053	·021	·009	·366	·394	1·38	4·7
Tottenham Board of Health	45·80	·020	·006	·005	·443	·453	3·20	23·9
Corporation of Birmingham*	28·60	·231	·069	·002	·143	·213	1·40	20·0
Corporation of Glasgow†	2·20	·164	·005	·003	·004	·011	·69	1·4

* Analyzed by Dr. Alfred Hill, Medical Officer of Health and Analyst to the Borough.
† Analyzed by Dr. E. J. Mills, F.R.S., of the Andersonian University, Glasgow.

Note.—The numbers in the analytical table can be converted into grains per imperial gallon by multiplying them by seven, and then moving the decimal point one place to the left. The same operation transforms the hardness in the table into degrees of hardness on Clark's scale.

Major Bolton reports that the state of the water in the Thames and Lea was fairly good during the month of March, the water taken in by the companies for distribution having considerably improved. The water in the River Thames at Hampton, Molesey, and Sunbury (where the intakes of the West Middlesex, Grand Junction, Southwark and Vauxhall, Lambeth, Chelsea, and East London Companies are situated) was fairly good during the month of March. The highest flood state of the river was 1 foot 10 inches above the (6 feet) summer level, and the lowest was 4 inches above summer level. The highest temperature of the water taken at Seething Wells was 48°, and the lowest 39°, while the highest temperature of the air at the same place was 50°, and the lowest 26°. The condition of the water in this part of the river was good on three days, indifferent on 16 days, and bad on 12 days during the month. The highest flood state was 2 feet 7 inches above, and the lowest 1 foot above summer level. These observations were made daily at 9 a.m. The rainfall for the month was 1·95 inches.

Dr. Whitmore's report on the composition of the Thames companies and other waters supplied to Marylebone during March:—

—	In Grains, per Gallon.			In Parts, per Million.		In Degrees.	
	Total Solid Matter.	Loss by Incineration.*	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Hardness.	Hardness after boiling Fifteen Minutes.
West Middlesex	20·00	0·88	1·14	·01	·08	13·6	2·9
Grand Junction	21·28	0·92	1·16	·02	·08	14·3	3·1

* The loss by incineration represents the amount of organic and other volatile matters contained in the Imperial gallon (70,000 grains) of water; the total solid matter, *minus* such loss, consisted chiefly of carbonate of lime, with small quantities of other equally harmless salts.

The water of both companies, as seen through a glass tube 2 feet in length, was clear, bright, and colourless.

SHEFFIELD UNITED GAS COMPANY.

The Forty-fourth Ordinary Meeting of Shareholders was held on Friday last—Mr. F. T. Mappin in the chair.

The following report and accounts were submitted:—

The profits for the half year ending the 31st of December last were £29,160 11s. 7½d. Out of this your directors propose the payment for such half year of the usual maximum dividend, namely:—

Dividend on £135,000, class A stock, after the rate of 10 per cent. per annum	£6,750 0 0
Dividend on £209,053 10s., class B stock, after the rate of 10 per cent. per annum	10,452 13 6
Dividend on £99,700, class C stock, after the rate of 9 per cent. per annum	4,486 10 0
Dividend on 12,937 new ordinary £10 shares (second issue), £3 per share paid up, after the rate of 9 per cent. per annum, being 2s. 8d. and two-fifths of a penny per share, or	1,746 9 10½
Total	£23,435 13 4½

After payment of such dividends there will be a surplus of £5724 18s. 3d., which being added to the reserve-fund will raise that fund to £50,955 19s. 6d.

It will be in the recollection of the shareholders that, in the report made to them this time last year, the board intimated that they had decided from June 30, 1876, to make a reduction of 1d. per 1000 feet in the company's charges for gas supplied to all consumers.

The policy of this company's directors has always been to reduce the charges for gas from time to time, as early as, in their judgment, circumstances would justify such a step; and taking into account the sum which, out of profits made during the year 1876, was (notwithstanding the reduction made in June of that year) added to the reserve-fund, your board are glad to announce that they have determined, from the 30th of June next, to make to all consumers a further reduction of 2d. per 1000 cubic feet.

The directors have to regret the loss of one of their colleagues since they last met the shareholders, by the death of Mr. Samuel Parker, whose sound judgment rendered him at all times welcome amongst them. His place at the board has been filled up by the appointment of Mr. Henry Stephenson, of Endcliffe Vale.

No other special circumstances have occurred, since the last general meeting, calling for notice in this report, which your directors will consequently conclude by expressing the hope that the reduction above announced will meet with the approval both of the shareholders and the public.

Dr. Capital Account, for the Half Year ending Dec. 31, 1876. Cr.

Class A stock, fully paid up	£135,000 0 0	Land, buildings, parliamentary, and other expenses, works, and machinery (including mains to June 30, 1855)	£413,396 12 6
Ditto B do. do.	209,053 10 0	Mains from June 30, 1855	67,749 17 7
Ditto C do. do.	99,700 0 0	Meters	29,434 1 3
12,937 new ordinary £10 shares (2nd issue), £3 per share paid up	38,811 0 0	Balance	11,381 18 8
Amount raised on mortgage	39,400 0 0		
	£521,964 10 0		£521,964 10 0

Revenue Account.

Half year's gas and meter rents, due this day	£65,607 19 7	Half year's expenditure in the production of gas	£58,884 6 3½
Amount arising from the sale of coke, tar, waste lime, and ammonia water	18,623 11 0½	Paid mortgagees & bankers for interest during the half year	584 2 3
Amount realized from the manufacture of sulphate of ammonia, sale of gas-fittings, and work done (after deducting all charges) and house and other rents	4,397 9 6½	Balance	29,160 11 7½
	£88,629 0 2		£88,629 0 2
Balance brought down	£29,160 11 7½	Dividends payable May 1, 1877	£23,435 13 4½
		Balance to be carried to reserve-fund, May 1, 1877	5,724 18 3
			£29,160 11 7½

Maximum price of gas, 3s. per 1000 feet.

General Balance.

Balance of revenue account	£29,160 11 7½	Ledger balances, and accounts owing to the company	£57,068 12 10
Ledger balances, and accounts owing by the company	48,276 7 11½	Stores in hand	19,480 0 4
Balance of capital account	11,381 18 8	Balance due from bankers	12,268 8 8
		Balance due from cashier	1 16 5
	£88,818 18 3		£88,818 18 3

Reserve-fund, invested June 30, 1876	£40,824 11 1
Amount transferred from revenue, Nov. 1, 1876	3,504 10 2
	£44,329 1 3
Interest to Dec. 31, 1876	902 0 0
	£45,231 1 3

The Chairman, in moving the adoption of the report, said he thought the profit the company had made during the past year—£29,160—must be satisfactory to the shareholders, as, after paying maximum dividends, they were enabled to carry £5724 18s. 3d. to the reserve-fund, which would make that fund amount to £50,955 19s. 6d. This had had the attention of the directors, and, after consideration, they thought they saw their way to make a reduction in the price of gas to the public on the 30th of June next of 2d. per 1000 feet. The quality they hoped would not be affected by the price being reduced, but they were determined that it should be better, if possible, than it had been. The working for the year had been varied, and had been affected to the advantage of the income, by the increase in the gas-rental of £713. The meter-rents had also increased, the tar had considerably increased, and the chemical-works had been satisfactory. It had also been affected by the decrease in the expenditure upon coals, stores, wages, repairs, labourers wages, and renewals. It had been affected adversely by an increase in the repairs of mains and service, local rates and taxes, to the amount of £1593, salaries, law charges, depreciation of meters, and dividends to shareholders for £1523, consequent on the reduction in the price of gas in June last. These, no doubt, were very good days for gas companies, and their profits appeared in almost all cases to be satisfactory. Some advantage had been given to the shareholders by almost all the companies in the kingdom, and this had directed attention to the prosperity of gas companies, for they found that Mr. Raikes, the Chairman of Committees in the House of Commons, had introduced a motion for a Standing Order that in future all capital authorized was to be offered to the public by auction. This he proposed to consider on March 27; it was postponed to April 6, then to April 17, and now stood for discussion that day. Now this proposal could not be viewed in a favourable light for gas shareholders established under an Act of Parliament which limited their dividends, and placed them under stringent obligations. No doubt the House of Commons had the right and power to make alterations in any Act of Parliament in the interest of the public, but he thought it was very much to be objected to that Acts of Parliament should be altered by a simple Standing Order, and he thought that the Government—if they wished to make this alteration—should bring a Bill in, and have it fully considered and debated upon. He (the chairman) did not see why gas companies and water companies should be first dealt with in this way. Other companies would follow, no doubt, if this was carried; but he did not think that a hard and fast line was good either for consumers or for companies. There were many circumstances that might arise in gas companies; they might not be successful, as the Sheffield Company had been; there might be, and were, certain conditions imposed upon them, such as supplying districts at a distance from their works, and which they might not be able to see their way to do in the hope of obtaining a remunerative return on their capital. Therefore there would be no inducement for those companies to extend their mains unless they saw some benefit to themselves as well. Besides, in Sheffield it had been beneficial to the consumer to have the price of his gas reduced, and the quality kept up as it had been, and the directors had attained this by giving a benefit to the proprietors and shareholders of the company. Considerable attention had been paid by the directors, not only during this year but for many years past, and they had endeavoured to manage the concern to the best advantage. They knew that, as they reduced the price of gas in Sheffield, they were enabled to pay a larger dividend upon the shares which were recently created. Therefore they had sufficient cause to object to so large an infringement upon the Companies Clauses Act of 1863, which provided for all additional capital to be allotted *pro ratâ* to existing shareholders, and he did not think that a Standing Order, affecting the large interests that it did, should be passed without being fully considered as a Bill before Parliament. For some little time the officers of the company had had their attention called to the exhibition of gas apparatus, and it was their intention to make an exhibition of the burners that were used by a large majority of the public—those burners being supplied by the gas company. It would show the consumers how much the satisfactory and economical use of gas was in their own hands, and dependent upon the adoption by them of good or bad burners. The condition of the company's works was satisfactory, and they were somewhat extending. The directors had, within the last few days, let a contract for the construction of a new gasholder, which they hoped would be completed and ready for use by the next winter.

Mr. J. GREAVES seconded the motion.

Mr. J. WILSON urged the desirableness of increasing the mains in the centre of the town, as there was a deficiency of supply in that portion of their district. In the months of November and December last the supply of gas in Shalesmoor, Snighill, and Gibraltar Street was very short, and much inconvenience was occasioned to the customers thereby.

The CHAIRMAN remarked that the size of the mains had considerably enlarged in some parts of the town. Complaints were formerly made from Shalesmoor and Snighill, but after the alterations took place no complaints had been made.

The motion was put and carried unanimously, and the dividends recommended in the report were declared.

Mr. J. BARBER: Will the proposed reduction in the price of gas bring with it increased dividend to the new shares?

The CHAIRMAN: It will not bring any increased dividend to the new shares.

Mr. HOBSON: You have got 9 per cent. instead of 7½.

The CHAIRMAN: The reduction last year did bring an increase of dividend but the present reduction will not.

Mr. F. E. SMITH: What reduction does increase the dividend? Is it not 1d. or 1½d. further?

The CHAIRMAN: Should we supply the public at 2s. 9d., I believe the dividend will be increased to 10 per cent., which will be the maximum.

Mr. WILSON moved a vote of thanks to the chairman, which was seconded by Mr. ROOME, and carried unanimously.

The CHAIRMAN, in replying, said: It is satisfactory to a chairman to be connected with a prosperous and successful undertaking at all times, and I do not like to be connected with a bad one. If I am, I like to know the reason why, and as long as I am supported by my brother directors, and remain the chairman, I shall hope to conduct this company to the satisfaction of the shareholders.

SHEFFIELD WATER-WORKS COMPANY.

The Ordinary General Meeting of this Company was held on the 16th inst.—Mr. W. COCKAYNE in the chair.

The directors report was as follows:—

After payment of all expenses of the company, interest on debentures, and the sum of £32,885 10s. dividends on preference shares, there would, if the interest on the capital invested in the company's works and land not yet utilized for the supply of water (being the sum of £19,991 19s. 5d.) were charged to capital, and not to revenue, in accordance with the course adopted by the company in obedience to the order of Vice-Chancellor Malins made in 1872, remain a balance on revenue account of £20,033 12s., which would be sufficient to pay a dividend of 4 per cent. for the whole of the year 1876 on the ordinary shares, leaving a balance of £1579 12s. to be added to the surplus fund.

The position of the company's non-utilized works, and other circumstances, however, now being different from what they were when the order was made by Vice-Chancellor Malins, the directors have considered it incumbent upon them to abstain from making the usual intermediate dividend in November last, and to apply to the Chancery Division of the High Court of Justice to decide how far the former order is applicable to the present state of the company. This decision of the Court could not be obtained in time for the general meeting; the above sum of £19,991 19s. 5d. has therefore been carried to a suspense account, there to remain until such decision shall have been got. Should the Court decide that this sum is a proper charge against revenue, there will remain a balance of £61 12s. 7d. only, which would obviously be incapable of division, and which the directors would consequently recommend to be carried forward to the account of next year. Should the Court decide that the former order is still applicable, the directors propose to call an extraordinary general meeting of the company as soon as the decision is obtained, and it will be for that meeting to determine whether a dividend shall be declared, and of what amount, for the whole of the year 1876.

The directors have pleasure in stating that up to the 31st of March they had succeeded in renewing debentures of the company to the amount of £397,000 at the rate of 4 per cent. interest, and they have no doubt that the remaining debentures, which now bear a higher rate of interest will, as they become due, be also renewed at the rate of 4 per cent.

The directors propose to offer for sale in the course of the ensuing summer a large quantity of the land at Crooke's Moor, which they are advised by the company's engineer will not now be required in connexion with the supply of water to the town, as well as the site of Limerick Wheel, destroyed by the inundation of 1864, and the property connected with it.

The directors wish to draw the attention of the shareholders to the fact that the water-rates for the year 1876 exceed those of the previous year by the sum of £3648 8s. 5d., which is the largest normal increase yet obtained in any single year of the company. The directors trust that the shareholders will see in this fact evidence that, although many difficulties yet attend the undertaking, there is no reason for despairing of its ultimate success.

The company's engineers report as follows:—

"*To the Chairman and Directors of the Sheffield Water-Works Company.*

"30, *Great George Street, Westminster, S.W., March* 28, 1877.

"Gentlemen,—We have the honour to report that we have examined the storeage reservoirs of the company, situate in Redmines, Rivelin, and Loxley valleys, and have found the embankments and other works to be in good and water-tight condition. There are now about 2500 million gallons of water in store, ready to meet the demands of the approaching summer.—We are, gentlemen, your most obedient servants,

"T. AND C. HAWKSLEY."

The directors are glad to be able thus to assure the shareholders that the ability of the company's works to meet the requirements of the town and district during the ensuing summer is placed beyond reasonable doubt.

The directors have had to regret, during the past year, the deaths of two of their number—Mr. Charles Hoole, who for many years bestowed much time and thought on the affairs of the company, and whose services were of great value; and Mr. Charles Wardlow, who, though he had only recently joined the board, had evinced great interest in the affairs of the company, and a desire to become an efficient member.

The company, during the last year, laid pipes to the extent of about 7½ miles; the entire length of the pipes is now about 205½ miles.

The company now supply with water 36,200 houses, besides other property. This number of houses exceeds by 2000 those supplied in 1875.

The CHAIRMAN moved the adoption of the report. He said in that document everything of moment was so fully stated that there was very little for him to add. The first thing which was encouraging was the large increase of the annual income, and it had shown an increase of above £4000, instead of £3700 in 1875. He was glad to say this increase had been steadily going on with the increase of the town, and it might be expected to grow in a larger ratio. In 1873 the water-rates were £48,854, in 1876 they were £63,781, or an increase in three years of £14,927. Mr. Ashton, the manager, was doing all he could to make the water company a paying concern. The rents were collected quarterly, and were so well managed that the loss by bad debts was not quite 8s. 9d. per cent. on an income of £63,781. The advantage of this system was that the money was paid into the bank, interest was allowed on it, and generally they had a good sum to their credit there. If they could only rest for some time they would soon be able to pay the old shareholders, out of revenue, a dividend of 5 per cent. per annum.

Mr. S. ROBERTS seconded the motion, which, after some lengthy observations by Mr. ASHTON on the position of the company, was put and carried unanimously.

Thanks were then voted to the directors for their past services, and the CHAIRMAN acknowledged the same.

The outgoing members of the board were re-elected, and a vote of thanks to the chairman closed the proceedings.

Mr. E. J. SOUTHWELL, the secretary of the Commercial Gas Company, who for 25 years was vestry-clerk and clerk to the guardians of Mile End Old Town, has been appointed by the Local Government a guardian of the poor of Mile End Old Town.

PRESTON GAS COMPANY.

The following report and summary of accounts for the last financial year, prepared by the borough accountant, has been laid before the council:—

To the Finance Committee of the Corporation of Preston.

Borough Accountant's Office, March 21, 1877.

Gentlemen,—Having examined the accounts of the Preston Gas Company for the year ending Nov. 30, 1876, I beg to submit the following particulars:—

REVENUE ACCOUNT.

Income.

Gas-rents, less discounts and abatements		£45,890 16 1	
Meter-rents		2,648 18 7	
			£48,539 14 8
Residuals—			
Coke	£4,956 19 5½		
Tar	1,971 6 10		
Salts	1,506 3 11		
		8,434 10 2½	
Sundries		222 5 5	
			£57,196 10 3½

Expenditure.

Manufacture—			
Cannel and coal	£20,443 4 10		
Wages	6,648 17 9		
Water	133 13 9		
Lime	949 6 7½		
		£28,195 2 11½	
Maintenance and repairs—			
Alterations and improvements	£3,149 17 9		
Mechanics repairs, and repairs of pipes	846 2 3½		
Meter repairs and fittings	689 8 6		
Retorts and fire-bricks	427 12 3		
		5,113 0 9½	
Management and establishment charges—			
Salaries	£2,336 3 4		
Rents, rates, and taxes	1,622 11 0		
Bank commission	50 0 0		
Sundries	525 3 9		
		4,533 18 1	
Interest on loans	£1,772 5 11		
Less bank interest, &c.	101 17 8		
		1,670 8 3	
		£39,512 10 1	
Balance, net profit		17,684 0 2½	
		£57,196 10 3½	

Dividends.

To Dividend declared for the year on	£120,000, stock A (10 per cent.)	£12,000 0 0	
Ditto ditto	69,000, stock B (7 per cent.)	4,830 0 0	
		£16,830 0 0	

RESERVE-FUND.

Balance to credit of general revenue account as reserve-fund, Nov. 30, 1875	£22,823 14 10½
Surplus profit added this year, after paying the above dividend	854 0 2½
Leaving the reserve-fund up to Nov. 30, 1876	£23,677 15 1

Being within £323 of the maximum allowed.

CAPITAL ACCOUNT.

The share capital was increased by a call of £9000, paid on Dec. 1, 1875, and an additional sum of £6900 has been borrowed on mortgage; making the total increase of share and borrowed capital, during the year, £15,900.

The capital account stood as follows, Nov. 30, 1876:—

Amount expended on the gas-works and plant, Nov. 30, 1875			£248,695 7 11½
Expenditure in 1876, viz.—			
Mains and service-pipes	£4,213 8 4		
Meters	989 4 2		
New offices in Fishergate, extensions at works, and purchase of property adjoining works	13,545 17 7		
		18,748 10 1	
		£267,443 18 0½	
Proprietors capital—			
Stock A (10 per cent.)	£120,000 0 0		
Stock B (7 per cent.)	69,000 0 0		
	£189,000 0 0		
Loans	49,729 8 6		
Premium on sale of stock B	88 12 3		
		238,818 0 9	
Balance on capital account		28,625 17 3½	
		£267,443 18 0½	

SUPPLY OF GAS.

The quantity of gas supplied during the year has been as follows:—

To Ordinary Consumers.

	Cubic Feet.	Per 1000.	
Preston and Fulwood	228,484,200	4s. 2d.	£47,600 17 11
Out-townships	3,884,300	4s. 7d.	890 3 0½
Ditto	10,232,100	5s. 0d.	2,558 0 6
Ditto	15,000	6s. 0d.	4 10 0
	242,615,600, at a gross charge of		£51,053 11 5½
Or an average of 50·50d. per 1000 cubic feet.			
Upon which discounts, bad debts, and abatements amounted to			7,773 2 4½
Being an average of 15·22 per cent., or 7·69d. per 1000 cubic feet.			
Leaving the net amount received for private consumption			£43,280 9 1
Or an average of 42·81d. per 1000 cubic feet.			

To Street-Lamps.

	Cubic Feet.		
Quantity supplied	15,662,200	Net charge	2,610 7 0
Total consumption	258,277,800	And net revenue	£45,890 16 1

Or an average of 42·64d. per 1000 cubic feet.

The following was the company's position on Nov. 30, 1876, as per balance-sheet:—

Capital and Liabilities.			*Property and Assets.*		
Capital (10 per cent.)	£120,000 0 0		Works, mains, meters, &c.		£267,443 18 0½
Capital (7 per cent.)	69,000 0 0		Stores of cannel, coke, and sundries		8,774 19 11
	£189,000 0 0		Debtors for gas and residuals		1,123 1 9½
Sale of stock B	88 12 3		Balance in bank		813 8 11
Loans	49,729 8 6				
Reserve-fund	23,677 15 1				
Dividends due for half year ending Nov. 30, 1876	8,415 0 0				
Creditors	7,244 12 10				
	£278,155 8 8				£278,155 8 8

The proportions of material used in gas manufacture during 1876 have been 44·19 per cent. of cannel, and 55·81 per cent. of coal.

During the past year the consumption of gas in the borough and Fulwood has been 6,121,300 cubic feet more than in 1875, and in the out-townships 1,289,800 cubic feet more, being a total increase in sale of 7,411,100 cubic feet.

The quantity of gas used in the street-lamps was 294,600 cubic feet less than in the previous year.

The gross revenue shows an increase of £2158, and the net profits an increase of £1513.

The following shows the proportion of income and expenditure under the different heads, and the amount per 1000 cubic feet of gas sold:—

	Proportion per Cent. on Total Income.		Per 1000 Cubic Feet of Gas Sold.
Income.			
Gas-rents	80·23	....	42·64d.
Meter-rents	4·68	....	2·46
Residuals	14·75	....	7·83
Sundries	·39	....	·20
	100·00		53·13d.
Expenditure.			
Manufacture	49·30	....	26·20d.
Maintenance	8·04	....	4·75
Management	7·92	....	4·21
Interest on loans	2·92	....	1·55
Net profit	30·92	....	16·42
	100·00		53·13d.

The actual cost of producing the year's saleable quantity of gas, including interest on loans, maintenance of works, and all other expenses in connexion with the working of the establishment, was 2s. 4¼d. (28·88d.) per 1000 cubic feet, against 2s. 5¼d. (29·65d.) in 1875.

The company's present position, as compared with nine previous years, is given below:—

Year.	Expended on Works.	Gas Sold in Millions	Net Gas Rental.	Net Profit.	Dividend.	Added to Reserve.
1867	£166,915	176	£32,325	£14,458	£12,315	£2,143
1868	181,134	175	31,959	12,566	12,420	146
						Deducted.
1869	201,321	169	31,081	11,686	13,207	£1,521
1870	206,799	180	33,199	13,874	13,890	15
						Added.
1871	212,294	208	38,064	18,312	14,047	£4,264
1872	223,710	225	39,953	20,372	15,150	5,222
1873	226,974	222	39,341	17,854	15,570	2,284
						Deducted.
1874	236,702	233	41,524	15,220	15,570	£349
						Added.
1875	248,695	251	44,536	16,170	16,042	£128
1876	267,443	258	45,890	17,684	16,830	854

From and after the taking of the meters for the last (December) quarter, there is a reduction of 10 per cent. in the charge for gas, which (with the discount off) makes the net price to small consumers 3s. 2¼d. per 1000 cubic feet; and to consumers of over 2 million cubic feet per annum, 3s. per 1000 cubic feet.

(Signed) JAMES CARTER, Borough Accountant.

WOLVERHAMPTON CORPORATION WATER SUPPLY.

At the Meeting of the Wolverhampton Town Council, on the 9th inst—the MAYOR (Mr. S. Dickinson) presiding,

The Water-Works Committee presented their report and balance-sheet for the past year. The report was as follows:—

The Water-Works Committee have pleasure in laying before the council the duly audited balance-sheet and account of income and expenditure of the water-works undertaking for the year 1876, from which it will be seen that during the year a profit of £1691 3s. 7d. has been made.

The capital of the water-works company at the time of the sale to the corporation on Jan. 1, 1868, consisted of the following items:—

Original share capital	£100,000	0	0
Five per cent. preference share capital	24,415	0	0
Loans and debt to the old company	86,246	0	0
	£210,661	0	0

The actual expenditure on the works and plant at the same date amounted to £210,327 10s., the balance being made up of the floating stock of fitting materials.

The expenditure on capital account now stands as follows:—

Amount to the 1st of January, 1868				£210,327	10 0
Additional expenditure in	1868	£127	11 3		
,, ,,	1869	407	6 0		
,, ,,	1870	598	12 2		
,, ,,	1871	360	9 1		
,, ,,	1872	248	18 9		
,, ,,	1873	151	14 11		
,, ,,	1874	3081	18 2		
,, ,,	1875	1642	9 0		
,, ,,	1876	1748	0 0		
Extension at Sedgley, 1876		2233	11 0		
Cosford Boring, 1876		1712	17 10		
				12,312	8 2
				£222,639	18 2

The capital on which the corporation pay interest is as follows:—

Debentures at 4½ per cent.	£18,400	0	0
Debentures at 4 per cent.	80,630	0	0
	£99,030	0	0
Preference share capital at 5 per cent.	24,415	0	0
Original share capital at 4 per cent.	100,000	0	0
	£223,445	0	0

Alderman FOWLER, in moving the adoption of the report, said the council had also before them a detailed statement of the income and expenditure of the Water-Works Committee, extending over a period of nine years, during which time the works had been under the management of the Corporation. From this statement the council would observe that during the past year the total income of the committee had been £18,174, and that the working expenses, including repairs to engine, coals, taxes, salaries, and all other expenses of that kind, were £7408 10s. The interest upon capital was £9074 7s. 4d., making the total expenditure £16,482 17s. 4d., thus leaving a net profit to the town of £169 3s. 7d. This was the third year in which he had had the honour of presenting to the council a report from the Water-Works Committee, showing that the undertaking was not only paying its way, but was making a profit, and therefore there was good ground for believing that this was a normal state of things which they might expect to see continued in the future, and that the property thus acquired by the corporation was one which they had no reason to regret ever having purchased. The total amount of capital on which they had to pay interest was £223,445, and the rate of interest which they had to pay was only 4½ per cent. Now, when he told them that there were other corporations in the country who had bought water-works like themselves, for which they were paying 6, 7, 8, and even 10 per cent. interest on the share capital, he thought the town council and the inhabitants of Wolverhampton generally would be perfectly satisfied the amount of interest the corporation were paying, £4 2s. 6d. per cent., was very reasonable indeed. In fact, he doubted whether any other corporation in the kingdom had accepted water-works on more satisfactory terms. There were two very excellent features in connexion with the undertaking. The first was that the water-works, which now belonged to the corporation, had never cost the town a single penny. It was quite true that during a period of two or three years the water-works were carried on by the committee at a loss, but during that time the committee borrowed the money which was required to make up that loss, and they paid the interest on the borrowed capital out of the annual revenue; so that this "terribly extravagant bargain," which some people said the town had incurred in taking to these water-works, all amounted to this—that after nine years (and during the whole of that time they had had the water-works in their own hands, and supplied the town with water without costing them one single halfpenny) they were now entering their tenth year, with every prospect of a continual profit for the benefit of the community at large. He would also mention that this satisfactory state of things had not been brought about, as had been stated outside, by the corporation having raised the rates charged for the water which they supplied. The Act of Parliament empowered the committee to charge their consumers at the rate of 7 per cent. on the rental. The corporation had never charged more than 6 per cent., although if the works had remained in the hands of the old company there was no doubt they certainly would, as they told the corporation at the time, have raised their rates very much higher than they were, and they would have been perfectly justified in so doing. He had prepared for the information of the council a detailed statement, which showed at a glance the quantity of coal consumed, and all the other incidental expenses of carrying on the works, and he would say, on behalf of the committee, that they should be very much indebted to any gentlemen who examined that statement if they could make any suggestion for carrying on the works at a less cost or with greater benefit to the inhabitants. The committee would be very glad to adopt any such suggestion if they could satisfy themselves that it was a practical one, and one which would result in benefit to the town, their only desire being to carry on the works as profitably as they could.

Mr. KENDRICK, who seconded the motion, said the success of the Water-Works Committee was beyond his former expectations, and he congratulated them that they had not only carried on the undertaking at a profit, but had supplied the town with a much better quality of water.

Several members addressed the council in terms of congratulation on the satisfactory nature of the report.

Alderman MAJOR said he well remembered that the question of purchasing the water-works was under consideration soon after he became a member of the council, and he supported the purchase on sanitary grounds, because he considered it desirable for the health and in the interests of the community at large that the water-works should be in the hands of the corporation. The terms offered to the council were so favourable that if they had not accepted them such an opportunity might never again have been afforded to them; and he did not know any other corporation in the country who had obtained possession of water-works like theirs for so low a sum as 4½ per cent. of the capital. Therefore, on commercial grounds, as well as sanitary ones, the speculation was a good one. As chairman of the Sanitary Committee, he had had samples of the water from the water-works and from various public and private wells in the town, sent to Dr. Hill, of Birmingham, for analysis as to their quality. The samples were not marked in any way to indicate to Dr. Hill the sources from whence they were obtained, but it was a significant fact that whilst Dr. Hill, in the report he sent back, strongly condemned the water obtained from the different wells, he spoke very favourably of the sample sent from the water-works. He wrote of it: "I don't believe this is well water at all, but it appears to me to have emanated from some stream or rivulet." Of course they had seen complaints about the water in the public press, and he had heard complaints made in the council chamber; but it struck him that the people who wrote about the water in the newspapers knew very little what they were writing about. There were times, of course, when the water appeared a little discoloured, and did not look well to the eye, but that was after a continuance of heavy rains, when the floods in the river brought down quantities of silt, but if the water was passed through a filter—and he always used a filter himself—it would be as good water as they could desire. In fact, the water they obtained from the river was the best quality of water he knew of; and he did not hesitate to say that there were few towns in the kingdom better supplied with water than Wolverhampton. As the council had been informed, the committee were now completing operations, which they had been making for some time past, to obtain a sufficient supply of pure water from artesian wells, by which the water would always be of one uniform quality and appearance, although he must say that his opinion in favour of the river water was so strong that he should prefer it. Another feature in the report to which he would refer was this—that there were upwards of 4000 houses in the borough that were not supplied with water from the water-works, and he ventured to say that, in nine cases out of ten, they obtained their supply from a very impure source indeed. The Sanitary Committee had never had occasion to obtain an analysis of water derived from any of the wells in the borough without finding that the water was condemned for drinking purposes. It would, therefore, come to this, if the various property owners in the town would not have a proper supply of pure water put on to their houses, the council would have to apply for power to prevent the use at all, for drinking purposes, of water obtained from private wells.

After some further conversation the report was adopted.

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND NORTH DERBYSHIRE.

(FROM OUR OWN CORRESPONDENT.)

There has been a good deal of uneasiness in the local iron and coal trades during the week just ended. The amount of business done in pig iron has not been very extensive, and such sales as have been effected have been on a decidedly quieter basis. Smelters are, at the same time, likely to reduce their production, rather than submit to any considerable drop in selling prices. Rather more North and Mid Lincolnshire pig is coming into this district just now, but contracts for the quarter just begun are said not to be very heavy. All branches of the coal trade are very quiet, the incipient recovery of the steam coal branch being now seriously impeded by the war panic, and consequent heavy advances in North Sea and other freights. Locomotive coal is being sold at 7s. 6d. to 8s., and good steam coal at from 8s. to 9s. 6d. per ton at the pits of South Yorkshire.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

Inquiries for gas coal continue to be made in this district, and consumers are evidently beginning to make preparations for next season's contracts. Of course it is too early, as yet, to offer any definite opinion as to the probable terms on which gas companies will be able to secure their supplies. Indeed, in the best informed quarters, opinions vary very considerably. By some, the realization of good prices is looked forward to; but although, as I have stated in a previous report, cannel and the best descriptions of gas coal may maintain their price, it is not at all improbable that in the commoner sorts of gas coal there will be sellers willing to take low rates to secure contracts. In other classes of round coal, with the exceptions of the common qualities for forge purposes, there has been a moderate amount of business doing, some of the best coal collieries being busy, and

prices are steady at 9s. 6d. to 10s. 6d. per ton for good Arley, 8s. 6d. to 9s. for Pemberton four-feet at the pit mouth; but common coal is weak and irregular. For good burgy there is a fair inquiry, and slack continues stiff in price. Good burgy at the pit is worth 5s. 6d. per ton, and slack is quoted at 3s. 9d. to 4s. 9d., according to quality.

The shipping trade has been a little more active so far as exports are concerned, but for coasting there is still only a poor demand.

The coke trade continues very dull, and although list rates nominally are without change, lower prices are being taken to secure orders.

For iron there has been scarcely any inquiry, but local makers still hold for late rates, as they find it useless to attempt, in the face of the present low price of north country iron, to attempt to meet the quotations now offering in the market. Finished iron is very flat, and the average quotations for delivery into this district are about £6 15s. per ton, and £6 17s. 6d. per ton for Staffordshire bars; light rails are quoted at £6 10s., and heavy ditto at £6 5s. per ton.

THE COAL AND GENERAL TRADE OF THE NORTH.

(FROM OUR OWN CORRESPONDENT.)

During April the coal trade of the North of England, though there has been a great amount of external excitement, especially within the last eight or ten days, has fluctuated very little. The impending war has made no impression upon prices. It has occasioned a little more demand for the better qualities of steam coal, but beyond that the trade is pretty much where it was in the beginning of the month. As the Baltic has opened, any falling off in the demand for home consumption has been compensated by shipments for that sea. The trade goes on very steadily. Best gas collieries are working tolerably good time, as they have done all the winter. Second-class gas coals are not at all in such a favourable position. The market is over-supplied with them. Prices are low, and they will certainly not alter for the better during the months of the latter spring and the summer.

While there has been no absolute change in the position of the coal trade, the freight market has been considerably affected within the last week by the absolute certainty that there will be war between Russia and Turkey. Rates to Constantinople and Cronstadt have advanced £2 per keel, whereas the freights for corn from Odessa paid to unchartered steamers upon the spot have exactly doubled within the week, and there has been a considerable rise in freights from Sulina, and also from the Russian ports of the Baltic. The heavy advance upon these classes of freights have affected rates generally, though not to any material extent. They are all stiffer, and coasting rates have probably gone up 3d. per ton.

The general manufacturing trade of the North of England is in a very depressed state. There is little or no demand for iron, very limited inquiries for fire-bricks and cement, and the chemical market was dreadfully dull all last week, and prices were lower.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

It has been arranged that the fifth annual meeting of the West of Scotland Association of Gas Managers shall be held at Linlithgow on Thursday next, under the presidency of Mr. Levi Monk, of Lanark. An excellent programme of business has been provided by the committee of the Association. Besides a number of formal business items, there will be the president's address; report by a sub-committee on Messrs. Aitken and Young's patent process of gas manufacture, and remarks on that process as carried out at Hamilton Gas-Works; paper by Mr. D. B. Peebles, on "The Application of Electricity to Peebles's System of Controlling the Action of Gas Governors, and its Adaptation for giving Flash Signals for Lighthouses, Railway Signals," &c.; discussion on the same; discussion on Mr. Monk's paper on "Twenty-Candle Gas as the National Standard Illuminating Power for Scotland;" and discussions which members may introduce on subjects connected with the manufacture, distribution, or consumption of coal gas.

Mr. Falconer King's report upon the analysis of the gas supplied to the City of Edinburgh on Wednesday, the 4th of April, was submitted to a meeting of the Town Council of Edinburgh, held last Tuesday. It stated that the Edinburgh Company's gas had an illuminating power of 30·7 standard candles; that there was no hydrosulphuric acid present, and that ammonia was distinct. The Leith Company's gas had an illuminating power of 29·5 candles, hydrosulphuric acid being entirely absent, but ammonia present.

The report on the Glasgow gas for the week ending the 14th of April shows that the average illuminating power ranged from 25·57 candles to 27·55 candles, the highest maximum being 28·03 candles at West Street Station (Tradeston works), and the lowest minimum 24·48 at St. George's Cross Testing-Station, where the supply of gas is sent from the Dawsholm works.

In a recent issue of one of the local papers there was published an interesting correspondence between Dr. Whittaker, a resident medical gentleman, and Mr. Ross, the secretary to the Glasgow Corporation Gas Committee, with reference to a rather novel claim set up by the former. It may be remembered that in the early part of last December there was sent into some parts of the city a quantity of gas that was offensive to the consumers, on account of the imperfect manner in which it had been purified. In due course, Dr. Whittaker, like other consumers, received his gas account; but observing that it contained no deduction for the time during which it was bad, he at once returned it to the gas office, and drew attention to the matter. Mr. Ross replied, and remarked upon the very peculiar objection raised by Dr. Whittaker; but he would not consent to make any deduction. The correspondence was continued, and the Doctor at once thought of contesting the point at law; but he was warned that the interest of the corporation was so great that it would be liable to bias legal judgment. I suppose he has paid his account with as good grace as possible under the circumstances. The point raised by Dr. Whittaker is certainly a very novel one, and it would be interesting to know if he has really any ground, in equity or in law, for an abatement.

The magistrates of Edinburgh, at the instigation of ope of the Government inspectors, have recently resolved to make arrangements for having the gas-meters tested in one building, instead of five, as at present, so that the process of testing may be properly supervised.

There is some prospect that the Dundee Water Commissioners may arrange to send a supply of water over to Newport, in Fife, *vid* the Tay Bridge.

Two large wooden ships have just left the Clyde with cargoes of cast-iron pipes for the Rio de Janiero Water-Works.

During the past week there has been more firmness in the pig iron market, and prices have advanced; but there is no material improvement to report regarding the local coal trade.

PRESENTATION TO A RETORT FOREMAN.—On Thursday afternoon, April 19, a meeting of a pleasing and interesting nature was held at the Manchester Corporation Gas-Works, Medlock Street, for the purpose of presenting a testimonial to Mr. David Hughes, late retort foreman, on the occasion of his appointment to the position of manager at the Stretford Gas-Works. Mr. Samuel Barratt, the station manager, in suitable and appropriate terms, on behalf of the workmen, presented Mr. Hughes with a beautiful timepiece, observing that it was the embodiment of a general desire shown by his fellow-workman to give him some expression of their respect and esteem, which he had so deservedly merited by his courtesy during his long service of 30 years, of which time he had been retort foreman for 16 years. He wished him success in his new sphere of labour, and all his friends joined in their good wishes for his future prosperity and happiness. Mr. Hughes, in acknowledging the gift, said that he felt unworthy of so much honour, but proud and gratified that his humble services had given such satisfaction, and were so well appreciated. After a few remarks from Mr. John Merrill, general foreman, and Mr. R. Griffiths, retort foreman, the proceedings were brought to a close with a vote of thanks to the manager.

EXPLOSION AT THE MANCHESTER CORPORATION GAS-WORKS.—Shortly after ten o'clock on Sunday morning last an explosion, attended with serious results, occurred at the Manchester Corporation Gas-Works, Medlock Street, Gaythorn. The particulars given below are obtained from a statement furnished to the police. About half-past nine o'clock the retort foreman discovered that the gas was escaping from a main running east to north of the No. 1 retort-house. With the assistance of other workmen, he set to work to remedy the defect, and, with the view of preventing any casualty, ordered that the charge of gas usually delivered at ten o'clock be delayed—an order which, it is to be presumed, was attended to. Whilst the men were repairing the defect in the main, the gas filled the aperture between the surface of the pipes and the covering, the latter consisting of a layer of bricks, and an upper one of flags, and the gas becoming ignited at the conjunction of the 2-feet main with the 4-feet main, which communicates between the retorts and the exhauster, the result was a terrific explosion. The flags and other material were projected along the whole length of the retort-house, and several of the workmen who were thrown down by the force of the explosion were injured. One man, named White, had his right ankle, left shin, and left thigh fractured; he sustained also a deep wound on the forehead, and a wound at the back. It is not expected that he will recover. Considerable alarm was caused in the neighbourhood by the explosion.—*Manchester Guardian.*

WAVERLEY ASSOCIATION OF GAS MANAGERS.—A correspondent writes: "The thirty-second half-yearly meeting of the above Association was held at Selkirk on Wednesday last, it having been agreed at the last half-yearly meeting at Melrose, and on the kind invitation of Mr. Robson, our esteemed secretary, that we should visit Selkirk, and have an opportunity of inspecting the new works recently erected there from his designs, and under his superintendence, for the supply of gas to that thriving and industrious Royal burgh. The weather being propitious, a numerous muster of members and friends took place at the works, and, guided by Mr. Robson, made a minute examination of the whole establishment. The retort-house came in for a large share of attention, and from its spaciousness, perfect ventilation, and abundant light, was pronounced by all to be a model of what a retort-house ought to be. The purifiers, condensers, new station-meter, and coal sheds (which were well filled even at this season of the year with first-class parrot coal), all came in for a large measure of praise. After congratulating Mr. Robson on the completion of such commodious works, and in having at his command abundant means, whereby he will be enabled to supply the 'Sutors o' Selkirk' with good and pure gas for many years to come, the members proceeded to the 'Fleece' Inn for the transaction of the business of the association. Mr. Thomson, of Dunse, took the chair. Mr. Robson, secretary, read over the accounts, and ended by stating that there was a considerable balance to the credit of the Association, an announcement which was received with a round of applause. Mr. Thomson's term of office having expired, Mr. Smith, of Hawick, was unanimously elected chairman for the ensuing year, and it was arranged that the next half-yearly meeting should take place at Melrose, on the first Wednesday of September next. The retiring chairman made a few neat and appropriate remarks, on the advantages and pleasure to be derived from meetings such as ours, and then called upon members, who had any observations to offer, or questions to ask, on any subject connected with the manufacture of gas, to do so. An animated conversation took place, on the anomalous state of the coal market, as shown by the endeavour of the coal proprietors and agents to raise the price of parrot coal, notwithstanding the great fall which has taken place in the wages of the miners. The seal of the dip-pipe next occupied the attention of the meeting; but, as none of the members had tested any of the plans which have been proposed for lessening it, not much could be made of it. The difficulty of working "stamped meters" was next alluded to, and thoroughly acquiesced in; and the difficulty was stated to arise from the short range of the float, and the low pressure of half an inch, which the Act required the meters to be tested at. The hour for dinner having now arrived, the company marched to the dining-room, where a sumptuous repast was partaken of. After which Mr. Smith, the newly-elected chairman, in a bumper proposed — 'Success to the Waverley Association of Gas Managers,' which was enthusiastically responded to. Other toasts followed, and the chairman then proposed—'Success to our youngest brother, the Gas Managers Association of the North of England, expressing a wish that soon we may find it in our power to visit Newcastle, and pay our respects to the members in person.' This having been heartily responded to, the company broke up, and soon the trains were speeding them on their way—some east, some south, some west, some north; but all happy to meet, sorry to part, and wearying to meet again."

Register of New Patents.

APPLICATIONS FOR LETTERS PATENT.

1462.—LIVESEY, J., Westminster, "Improvements in filters for water and air." April 13, 1877.

1470.—LINFORD, C., Leicester, "Improvements connected with gas-engines." April 14, 1877.

1480.—SHAW, J., Lockwood, York, "A new or improved union or joint for pipes." April 16, 1877.

1503.—MORGAN-BROWN, W., Southampton Buildings, London, "Improvements in duplex pumping-engines." A communication. April 18, 1877.

1507.—FELLOWS, G., Hackney, London, "A new and improved method and apparatus for 'after-flushing' water-closets." April 18, 1877.

1520.—SCOTT, J., Glasgow, "Improvements in regulating valves for liquid service cisterns, for water-closets, and other purposes." April 19, 1877.

1533.—LAKE, W. R., Southampton Buildings, London, "Improved apparatus for lighting and extinguishing gas." A communication. April 19, 1877.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

4032.—HENDERSON, R., Timsbury, Somerset, "An improved tap for measuring, regulating, registering, ventilating, and preventing the waste of fluids and liquids." Oct. 18, 1876.

4106.—LEONI, S., New North Road, London, "Improvements in the construction of boilers to be heated by gas." Oct. 24, 1876.

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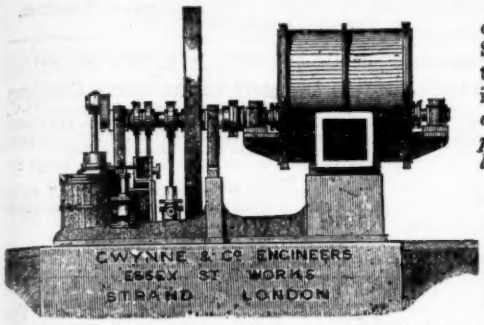

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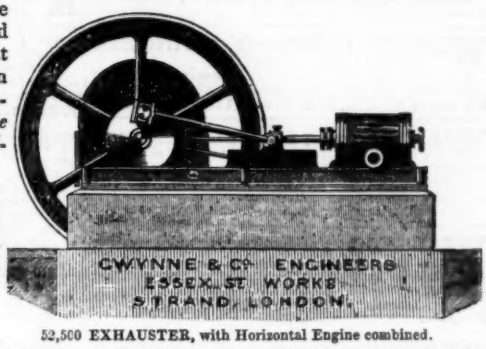

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Exhausters, with or without Engines combined, can be made to pass the gas without oscillation or variation in pressure.
Regulators, Bye-Passes, Stop-Valves, Gas-Valves, Station Governors, and Gas Machinery of all Sizes.

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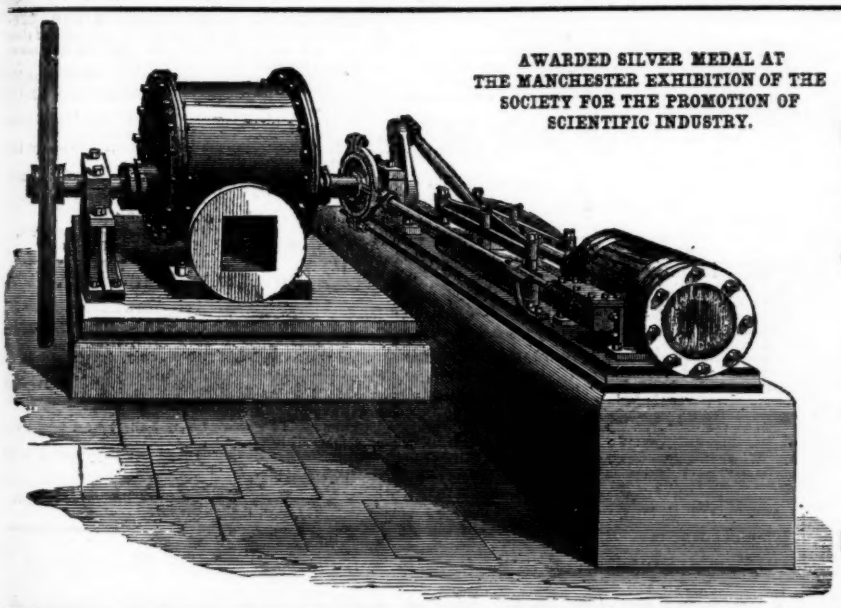

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OF WHICH UPWARDS OF 90,000 ARE NOW IN SUCCESSFUL USE.
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WANTED, Two Governors, second-hand, from 10 to 15 inches diameter.
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WANTED, by a Lancashire Manufacturing Chemist, large or small quantities of strong Gas AMMONIACAL LIQUOR, above 8° Twaddel.
Address No. 353, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED immediately, a First-Class MAIN and SERVICE LAYER.
Apply, by letter only, stating experience, present or last engagement, age, and wages required, addressed to No. 359, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by the Son of a Gas Engineer, a situation as Working MANAGER of small Gas-Works (has a thorough knowledge of manufacture and distribution), or as GAS-FITTER in large Works. Good references given. Aged 27; married.
Address C. TERDREY, jun., Gas-Works, TAVISTOCK.

WANTED, by the Cromer Gas Company, a Man to make the Gas and lay Service-pipes. Age not more than 50. A house, garden, fuel, and gas, with 25s. per week.
Apply, by letter, to W. LIMMER, Secretary, Cromer, NORFOLK.

WANTED, a situation as Inspector or MANAGER of the Outdoor Department. The Advertiser (aged 33), who has a thorough knowledge of the duties, seeks an engagement. Eight years with a London Company.
Address, INSPECTOR, 38, Tavistock Terrace, UPPER HOLLOWAY.

THE Advertiser is desirous of obtaining employment as Working MANAGER of a small Gas-Work, or as Inspector or Collector. Fully conversant with the manufacture and distribution of coal gas, main and service laying, and has a thorough knowledge of internal fittings. First-class references.
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TRAVELLER wanted, to call on Gas Companies, to sell Fire-Bricks and Retorts, Cast-Iron Mains, Gas Tubes, &c. Salary and commission. Some one preferred with a connexion among Gas Companies.
Address GAS AGENT, care of Wm. Dawson and Sons, CANNON STREET, E.C.

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A Gentleman, who possesses good influence with Gas Companies, Railway Engineers, and others, desires to undertake the London business of a firm of good standing, as he is relinquishing an engagement of a like nature, which he has held for Ten years, during which he has superintended some very extensive erections. Advertiser has handsome offices in Cannon Street, and would find staff, &c.; he to receive salary and commission.
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WE beg to call attention to our special STEATITE BURNERS for Street Lamps. Sample gross 8s. Quotations for quantities.
Messrs. TINDALL AND TELLING, Gas Apparatus Works, 74, Wynford Road, Penton Street, LONDON, N.

FOR SALE, a Set of Four Purifiers, 8 ft. square, dry centre-valve, grids, covers, and lifting gear, 8-in. connexions.
Apply to S. STUDHOLME, Gas-Works, WHITEHAVEN.

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FOR SALE, as they now stand, and at any reasonable price, as the ground upon which they stand is wanted, four 12-ft. square Cast-Iron PURIFIERS, with centre-valve and connexions, grids, tee bars, &c., complete.
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FOR SALE, Three Engines and Ex-hausters (Two by Gwynne, and one by Waller) for 15,000 feet per hour. Being about to be replaced by larger ones.
Can be seen at the Works, Walton-on-Thames, or particulars can be had of Mr. GEORGE ANDERSON, 35A, Great George Street, WESTMINSTER.

GASHOLDERS.

FOR SALE, Two Telescopic Gasholders.
One 50 ft. by 16 ft., the other 70 ft. by 20 ft., each complete, with cast-iron tanks, columns, girders, and inlet and outlet pipes, valves, &c., both of modern construction, in good condition, and made by Messrs. Piggott and Co., of Birmingham. To be seen at work at the Gas-Works, Birkenhead. Cause of removal to make room for extensions.
To be sold a bargain, taken down and re-erected ready for work.
For particulars apply to ASHMORE AND WHILE, STOCKTON-ON-TEES; or to view, apply to Mr. CALLOW, Gas Engineer, BIRKENHEAD.

THE Newport (Mon.) Gas Company have FOR SALE the following PLANT at their Works, Newport, Mon.:—
Two Cylindrical Boilers, 13 ft. by 4 ft., with fittings complete, and steam-pipes to engines.
Two Horizontal Engines, each cylinder 9½ in. diameter, and stroke of each 1 ft. 6 in.
Two Beale's Exhausters, made to pass 20,000 cubic feet per hour each, with regulators and bye-pass.
The above are in good order, have been working during the past winter, and are now offered for sale because larger ones have been fixed.
They can be seen at the Works, Mill Street, Newport, Mon.
THOMAS CANNING, Engineer.
April 20, 1877.

TO BE SOLD, Four Cast-Iron Purifiers, 6 ft. square, with hydraulic centre-valve; also Ten 18-in. round, and Sixty-two 15-in. round Retort Mouthpieces, and Forty-seven 6-in. H-Pipes.
Apply to W. WINSTANLEY, Manager, Gas-Works, NEWCASTLE-UNDER-LYME.

FOR SALE.

A Set of 8-in. Vertical Condensers, with tar-box and all connexions complete, containing about 180 ft. of pipes.
Also a SCRUBBER, 12 ft. high, 5 ft. diameter, with reversing valve.
The above are nearly new (only been in work six years), and are now removed to make room for larger.
May be seen and price obtained on application to H. and F. BAILEY, Engineers, EAST RETFORD.

THE Swansea Gaslight Company have for immediate SALE, the following Plant:—
A 6-h.p. Patent Trunk Engine. (Beale.)
Exhauster to pass 15,000 feet per hour. (Beale.)
An 8-h.p. Grasshopper Engine. (Easton and Amos.)
Exhauster, 20,000 ft. per hour. (Beale.)
Tar, Liquor, and Water Pumps, Eccentrics, Shafting, and Driving Pulleys.
Wrought-iron Condenser, six vertical Legs, 30 ft. high, 24 in. by 6 in., with tar-boxes, dips, and syphons.
A set of four cast-iron Purifiers, 12 ft. square by 5 ft. deep, with galvanized wrought-iron covers, lifting apparatus, four tiers of wooden sieves, 10-in. connexions and valves.
May be seen at the Gas-Works, Swansea. The whole in perfect working order; replaced by plant of larger dimensions.
Further particulars may be obtained on application to Mr. THORNTON ANDREWS, SWANSEA.

TO TAR DISTILLERS, DYE MANUFACTURERS, AND OTHERS.

THE Directors of the Swansea Gaslight Company are prepared to receive TENDERS for the purchase of the TAR produced at the Gas-Works, Swansea.
For information as to terms and conditions, apply to the undersigned,
THORNTON ANDREWS, Secretary and Manager.
Swansea, April 24, 1877.

TENDERS FOR GAS COAL.

THE Bangor Water and Gas Company, Carnarvonshire, invite TENDERS for 1400 tons of the best GAS COAL, to be delivered in such quantities, and at such periods as may be required during the Twelve months ending June 30, 1877.
Parties tendering must give full particulars of the Coal offered, and the colliery from which they propose the supply, to be delivered carriage paid at the London and North-Western Railway Station, Bangor.
Sealed tenders, addressed to the undersigned, will be received until the 15th of May next.
DAVID WHITE, Secretary and Manager.
April 21, 1877.

TENDERS FOR GAS COALS.

THE Directors of the Ashford (Kent) Gas and Coke Company, Limited, invite TENDERS for the supply of about 1800 tons of best GAS COAL (screened) to be delivered as follows:—300 tons in July next, 600 tons in August, 300 tons in October, 300 tons in December, and 300 tons in February, 1878.
Persons tendering to state the name and guarantee the particular seam from which the Coal is to be supplied free from bats, bind, dirt, &c. The price to be stated per ton, either free on board or delivered at the contractor's sole expense into the Company's Coal Store at Ashford.
Tenders, endorsed "Tender for Gas Coal," to be addressed to the Secretary of the Company, and delivered by Ten o'clock on Monday morning, the 7th of May next.
The Directors do not bind themselves to accept the lowest or any tender.
F. HUGHES-HALLETT, Secretary.
Ashford, April 21, 1877.

ROCHDALE CORPORATION.

THE Gas Committee of the Rochdale Corporation invite TENDERS for certain alterations and renewals of PLANT in their Retort-House.
Plans and specification may be seen at the Gas-Works, and any other information required will be furnished by Mr. Paterson, the Engineer.
Sealed tenders to be sent in to me not later than the 7th of May next.
By order,
ZACH. MELLOR, Town-Clerk.
Town-Hall, Rochdale, April 19, 1877.

WALTHAM ABBEY AND CHESHUNT GAS COMPANY.

THE Directors of the above Company invite TENDERS for the supply of 500 yards of 8-in. Cast-Iron PIPES (lead joints), and two 8-in. SYPHONS.
The Pipes not to exceed 3¼ cwt. each, and to be delivered at Waltham Station on the Great Eastern Railway.
The Directors do not bind themselves to accept the lowest or any tender.
Tenders, endorsed "Tender for Main-Pipes," to be addressed to the Chairman, and sent in on or before the 3rd of May prox.
By order,
HARRY TOWNSEND, Manager.
Gas Office, Waltham Cross, N.

BOROUGH OF HALIFAX.

THE Gas-Works Committee of the Corporation are prepared to receive TENDERS for the purchase of the whole of the AMMONIACAL LIQUOR manufactured on their premises for a period of One, Two, or Three years. The Liquor to be delivered either into railway tanks or canal barges, as the Contractor may desire.
Further particulars and forms of tender may be obtained on application to Mr. Wm. Carr, Engineer, Gas-Works, Halifax, and tenders, properly endorsed, must be sent to me on or before Thursday, the 3rd day of May, 1877.
By order,
A. C. FOSTER, Town-Clerk.
Town-Hall, Halifax, April 6, 1877.

TO CHEMICAL MANUFACTURERS, TAR DISTILLERS, AND OTHERS.

THE Chorley Commissioners are pre-pared to receive TENDERS for the purchase of their surplus TAR and AMMONIACAL LIQUOR for One or Three years from the 16th of October next.
The Commissioners will deliver the goods at the Chorley Railway Station into waggons to be provided by the Contractor.
Particulars may be obtained on application to Mr. Thomas Hamer, Gas Manager, Chorley, Lancashire.
The Commissioners do not bind themselves to accept the lowest or any tender.
Sealed tenders to be sent to the undersigned not later than the 15th of May next.
By Order,
RICHARD JACKSON, Solicitor,
Clerk to the Chorley Commissioners.
Dated the 6th of April, 1877.

RIPON CITY GAS-WORKS.

TO GASHOLDER MAKERS.

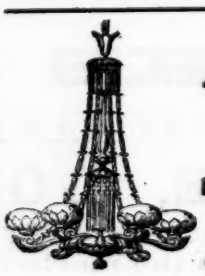
THE Corporation of Ripon are prepared to receive Plans, Specifications, and Tenders for a Single-lift GASHOLDER, 60 ft. in diameter and 16 ft. deep, with 10-in. valves, syphons, &c.
The plans, specifications, and tenders to be delivered at the Corporation Office, Stammergate, on or before the 10th of May next.
No allowance for plans, &c., and the lowest tender will not necessarily be accepted.
Further particulars may be obtained on application to the undersigned.
By order,
ROBERT DARNEY, Manager.
Gas-Works, Ripon, April 21, 1877.

Now ready, price One Shilling, No. 5 (to be continued Monthly) of

A TREATISE ON THE SCIENCE & PRACTICE
OF THE
Manufacture and Distribution
OF
COAL GAS.

LONDON: WILLIAM B. KING, 11, BOLT COURT, FLEET STREET,
OR OF ANY BOOKSELLER IN TOWN OR COUNTRY.

For the convenience of persons resident in remote districts, arrangements have been made by the Publisher to forward the "Treatise" by Post, securely packed on a roller, at the cost of the number and postage only—viz., 1s. 2d. Monthly, or 7s. for the Half Year.



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BROAD STREET, BIRMINGHAM.
ESTABLISHED 1807.
MANUFACTURERS OF CRYSTAL GLASS CHANDELIERS,
WALL LIGHTS, AND LUSTRES FOR GAS AND CANDLES.
TABLE GLASS OF ALL KINDS.
CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.

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19, GREAT GEORGE STREET, WESTMINSTER,
LONDON, S.W.,

MANUFACTURERS OF EVERY DESCRIPTION OF

GAS APPARATUS.

CONTRACTORS FOR THE

ERECTION OF GAS-WORKS, GAS-FITTINGS, &c.,

FOR TOWNS, COUNTRY MANSIONS, &c.

Estimates given free of Charge.

Now ready.

THE GAS & WATER COMPANIES DIRECTORY
FOR THE YEAR 1877,

EDITED BY

CHARLES W. HASTINGS,

8, BUCKINGHAM STREET, ADELPHI, LONDON, W.C.,

CONTAINS

An Alphabetical List of Towns in England having Gas or Water Companies.
Date of Formation of the Company.
If Incorporated under Special Act of Parliament, and the date of such Act or Acts.
If under any of the Limited Liability Acts.
Amount of Share Capital.
Name of Chairman.
Name of Engineer or Manager.
Name of Secretary.
If Let on Lease, Name of Lessee.
If a Private Venture, Name of Owner
If Purchased by the Corporation (and in cases where possible the date of such Purchase), or if the Property of the Local Authorities.
Population of all Towns.
Railway Communication, and the Distance from London.
Special Notice is taken of all the Members of the "British Association of Gas Managers."

THIS WORK IS UNDER THE PATRONAGE OF ALL THE LEADING GAS & WATER ENGINEERS AND SECRETARIES OF THE METROPOLITAN & PROVINCIAL COMPANIES.

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J. & J. BRADDOCK,

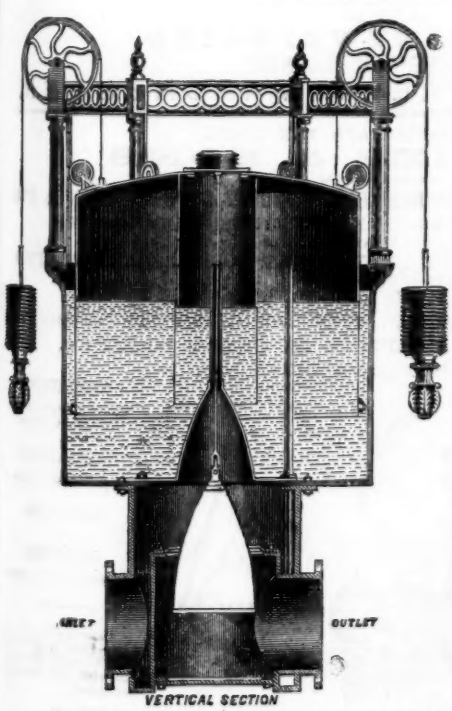
GLOBE METER-WORKS,

OLDHAM,

Beg to submit to Gas Engineers their

PATENT COMPENSATING GAS GOVERNOR,

Which is designed to give an uniform pressure at the Outlet to the Main at all draughts up to the full quantities which the Governors are made to control, such outlet pressure being less than the initial pressure.



VERTICAL SECTION

The uniformity of pressure is obtained by introducing a compensating chamber into the Bell or Holder of the Governor, which compensator is of the same area as the valve, both of which are operated on by the initial pressure, thereby placing the valve in equilibrium, no matter what the initial pressure may be. The action on the Bell is by the Gas passing along a pipe from the outlet, and the pressure is regulated by weights in connexion with the Bell as required.

From the sectional elevation attached hereto, it will be seen that only the Gas required to operate the Bell comes in contact with the water of the tank, which water will remain comparatively sweet and free from odour. That in case of accident to the Bell, no more Gas can escape than would pass up the pipe covering the valve-rod and Bell supply-pipe.

These Governors have been made and sent out of various sizes for from 2 to 24-inch Mains, and give most satisfactory results.

They can be made with Float in the Bell, or counterpoise as per section.

BOROUGH OF HALIFAX.

TO COLLIERY PROPRIETORS.

THE Gas-Works Committee of the Halifax Corporation are prepared to receive TENDERS for the supply of 22,000 tons of GAS COALS and 3000 tons of CANNEL, to be delivered upon the railway siding at their Gas-Works. The whole to be supplied before April 30, 1878.

Specifications and forms of tender may be obtained on application to Mr. Wm. Carr, Engineer, Gas-Works, Halifax, and tenders, properly endorsed, must be sent to me or or before Wednesday, May 16, 1877.

By order,
A. C. FOSTER, Town-Clerk.

Town-Hall, Halifax, April 21, 1877.

BOROUGH OF SOUTHPORT.

CONTRACT FOR IRONWORK.

THE Corporation are prepared to receive TENDERS for the supply and erection of certain Cast-Iron Columns, Girders, and Roofs at their Gas-Works, near Southport.

Drawings and specification may be seen at the Town-Hall, Southport, and at the Office of Mr. George Anderson, 35A, Great George Street, Westminster, on and after the 12th inst.

Tenders to be sent to me, endorsed "Tender for Gas-Works," on or before the 26th inst.

The Corporation do not bind themselves to accept the lowest or any tender.

By order,
KEIGHLEY WALTON, Town-Clerk.

BOROUGH OF SOUTHPORT.

CONTRACT FOR RETORTS & FIRE-CLAY GOODS.

THE Corporation are prepared to receive TENDERS for the supply of RETORTS and FIRE-CLAY GOODS required at their new Gas-Works, near Southport.

Drawings and specification may be seen at the Town-Hall, Southport, and at the Office of Mr. George Anderson, 35A, Great George Street, Westminster, on and after the 12th inst.

Tenders to be sent to me, endorsed "Fire-Clay Goods," on or before the 26th inst.

The Corporation do not bind themselves to accept the lowest or any tender.

By order,
KEIGHLEY WALTON, Town-Clerk.

BOROUGH OF BURNLEY.

THE Gas Committee of the Corporation are prepared to receive TENDERS for a supply of the best screened GAS COAL and CANNEL for One, Two, or Three years.

The quantities required for the first year will be 14,000 tons of Coal and 3000 tons of Cannel, to be delivered at the Gas-Works Wharf, on the Leeds and Liverpool Canal. For the second and third years the Corporation will expect to be supplied with any additional quantity they may require at the contract price.

Further particulars may be obtained on application to Samuel Petty Leather, Gas Engineer, Burnley, to whom all tenders, endorsed "Tender for supply of Coal and Cannel," must be sent on or before Wednesday, May 9, 1877.

By order,
A. B. CREEKE, Town-Clerk.

Burnley, April 17, 1877.

NEWMARKET GAS COMPANY.

THE Directors of this Company invite TENDERS for the laying of the following PIPES, including the total cost of materials (Pipes excepted), excavating, and reinstating the ground—namely, taking up and relaying 900 yards 6-in. Pipes (lead joints), and laying 900 yards 8-in. and 9-in. pipes (turned and bored joints), Average depth 18 inches.

Parties tendering to be prepared to give references.

Further particulars may be obtained on application to the undersigned, to whom tenders are to be sent on or before May 7, 1877.

The Directors do not bind themselves to accept the lowest or any tender.

By order,
THOMAS WILKINSON, Manager and Secretary.

Gas Office, Newmarket, April 20, 1877.

JOHN ROMANS, C.E., F.G.S.E.,

CONSULTING GAS ENGINEER

AND

CANNEL COAL FACTOR,

30, St. Andrew Square, EDINBURGH.

Plans and Estimates furnished; Gas-Works, Apparatus, Pipes, Machinery, Fire Goods, &c., supplied, or Attested and Shipped for Exportation.

GAS-WORKS TAKEN ON LEASE.

Mr. ROMANS has for upwards of 30 years been practically engaged in the Manufacture of Gas, and has, by extensive experiments, ascertained that by JUDICIOUS INTERMIXTURE of the lighter with the heavier gases, much of the rich Hydrocarbons CAN BE SAVED, which otherwise ARE LOST, during the process of manufacture. He is therefore enabled to give advice to those who favour him with their orders for Cannel, as to the class which will secure for their standard of illuminating power the HIGHEST ADVANTAGEOUS RESULTS.

ANALYSIS AND PRICES FORWARDED ON APPLICATION.

YEO'S PATENT ENGINE PACKING.

BY HER MAJESTY'S ROYAL LETTERS PATENT.

EPHRAIM YEO, Inventor, Patentee, and SOLE MANUFACTURER of the Patent Excelsior Self-Lubricating Rope Engine Packing; also Manufacturer of Improved Tarred and White Spun Yarn for Gas and Water Pipe Joints, Coke Sacks, Fall Ropes, &c.,

NEWTON ABBOT, DEVONSHIRE.

Samples and particulars forwarded on application.

THE Exeter Gaslight and Coke Company are prepared to receive Plans, Specifications, and Tenders for the supply, delivery, and fixing complete of two PURIFIERS, 24 ft. square, 5 ft. deep, with all necessary sieves, 15-in. valves, lifting apparatus, and connexions complete. The two Purifiers to be worked in connexion with two at present in use, and so arranged as to work either the whole four or separately.

Also for two Cast-Iron SCRUBBERS, 40 ft. high and 8 ft. diameter, and prices only for two the same height, but 10 ft. diameter, with all necessary valves and connexions complete.

Contractors to state the time in which they will undertake to complete the respective works.

Separate and sealed tenders for each of the above, marked "Tender," &c., to be sent to me, the undersigned, on or before Saturday, the 12th day of May.

No allowance for plans, &c., nor will the Directors pledge themselves to accept the lowest or any tender.

By order,
W. A. PADFIELD, Secretary.

Gaslight Offices, Exeter, April 19, 1877.

NEATH GAS-WORKS, SOUTH WALES.

TO ENGINEERS, CONTRACTORS, AND BUILDERS.

THE Neath Town Council hereby invite TENDERS for the following works:—

Contract No. 1.—The supply, construction, and erection of all the Ironwork, including the new 88 ft. Gasholder, necessary for New Works, to be erected at Millands, Neath.

Contract No. 2.—The providing of materials for and construction of Gasholder-Tank, 92 ft. diameter, and the providing materials for and erection of all Buildings, Boundary Walls, &c., necessary for said works.

General ground plan may be seen, and full particulars obtained, on application to the Gas Manager, at the Gas-Works, Neath.

Parties tendering for either or both Contracts must submit detail, plans, drawings, and specifications for the works, buildings, &c., included.

Sealed tenders, endorsed "Tender for Contract No. 1" or "Contract No. 2," as the case may be, to be sent, addressed "Gas-Works Committee, Neath," under cover to Town Clerk's Office, not later than Friday, the 4th of May, as the same will be considered on the following day.

The Council do not pledge themselves to accept the lowest or any tender.

By order,
ALFRED CURTIS, Town-Clerk.

Neath, April 23, 1877.

Now ready, price 7s., by Post 7s. 3d.,
A SECOND EDITION (fcap. 8vo., morocco gilt)
OF
THE GAS MANAGER'S HANDBOOK,
CONSISTING OF
Tables, Rules, and Useful Information for Gas Engineers, Managers,
And others engaged in the Manufacture and Distribution of COAL GAS.
BY THOMAS NEWBIGGING, A.I.C.E.

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PAMPHLET ON GAS.

COOKING AND HEATING.
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For GAS COMPANIES to distribute to their Gas Consumers.

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MAGNUS OHREN, Gas-Works, Sydenham, S.E.

HENRY LYON,
ENGINEER,
AND
CONSULTING GAS ENGINEER,
BROOKLYN, CHEETHAM HILL ROAD,
MANCHESTER.

ALFRED LASS,
SPECIAL ACCOUNTANT FOR GAS COMPANIES,
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Accounts analyzed and Statistics Prepared for Parliamentary Proceedings, Arbitrations, &c.

The Forms of Account, which have been specially designed by A. L. to meet the requirements of the Gas-Works Clauses Amendment Act, 1871, are now in use by many Gas Companies, and have been universally approved.

The above forms are registered.

Water Companies Accounts also prepared and adjusted.
CONSULTATIONS.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

Information as to cost, &c., supplied gratuitously upon application to the Advertiser, 22, Great George Street, WESTMINSTER.

W. HAILES,
FURNACE BUILDER AND RETORT-SETTER,
Contracts for the
BUILDING AND SETTING OF RETORT BENCHES,
In large or small works, at home or abroad;
Also to supply all kinds of
FIRE GOODS AND IRONWORK
Necessary for the Erection of Retort-Beds.

The greatest amount of heat by the smallest possible amount of fuel is the principle of the settings.

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No. 3, High Street, Brentford, MIDDLESEX.

JOHN HALL AND CO., STOURBRIDGE,

Manufacturers of FIRE-BRICKS, LUMPS, TILES,

AND EVERY DESCRIPTION OF FIRE-CLAY GOODS.

N.B.—A Stock of 15 and 16 in. CIRCULAR RETORTS always on hand. Other kinds made to order on short Notice.

JAMES MILNE & SON,

GAS ENGINEERS,

Gas-Meter, Gas Apparatus, and Gas-Fittings Manufacturers,
EDINBURGH, AND
2, KING EDWARD STREET,
NEWGATE STREET, LONDON.
Meter Works in London—2, CROSS STREET, WILDERNESS ROW, E.C.

STATION-METERS, GOVERNORS, CONSUMERS METERS, GAS LUSTRES, CHANDELIERS, BRACKETS, &c.,
And every description of Gas-Fittings and Gas Apparatus.

GAS PURIFICATION.

BAILES & HALLSWORTH,
CONTRACTORS FOR THE
PURIFICATION OF COAL GAS,
BY THEIR
PATENT OXIDE OF IRON COMPOUND.

The material is in use at most of the principal Gas-Works in Yorkshire and elsewhere. It contains considerably less moisture than natural Oxide of Iron. It is much cheaper and more efficient as a purifying agent.

B. & H. are purchasers of Spent Oxide, or will take Spent in exchange for New Material.

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IMPROVED RETORT-SETTINGS.

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Coloured lithograph copies of WORKING DRAWINGS of Beds of One to Seven Retorts (so clearly arranged and fully shown as to be easily understood by any retort setter or bricklayer) having been made of these valuable settings, they can now be supplied with detailed SPECIFICATION immediately on receipt of orders.

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CRYSTAL, BRONZED, & ORMOLU CHANDELIERS, IMPROVED CRYSTAL STAR & SUN LIGHTS, VESTIBULE LAMPS, AND THE PATENT CRYSTAL ILLUMINATION.
A LARGE STOCK ALWAYS IN HAND OF
IRON, BRASS, COMPOSITE, AND LEAD TUBES, FOR GAS AND WATER,
AND EVERY DESCRIPTION OF
GAS AND WATER FITTINGS.
THE PATENT DRY AND WET METER, WITH THE LATEST IMPROVEMENTS.
STREET LAMPS AND COLUMNS IN GREAT VARIETY.
WORKS: LONDON AND BIRMINGHAM.

GAS MOONS, Cut and Engraved, of the newest designs

GAS REFLECTORS In Silver and Glass

GAS NIBS AND **BURNERS** Of every description.

Pattern-Books of Gas-Fittings, Crystal and Ormolu Chandeliers for 1876, are now complete.

City Show-Rooms and Manufactory, 147, HOUNDSDITCH, LONDON.
ESTABLISHED 1830.

MESSRS. PELOUZE & AUDOUIN'S
NEW
PATENT CONDENSER,

For the Mechanical Condensation of the Liquefiable Matters in Gases or Vapours.

WILLIAM SUGG'S

PATENT

ILLUMINATING

POWER METER

For showing the Illuminating Power of Gas by the observation of one minute.

£26s. 10s. COMPLETE.

THE "LONDON"

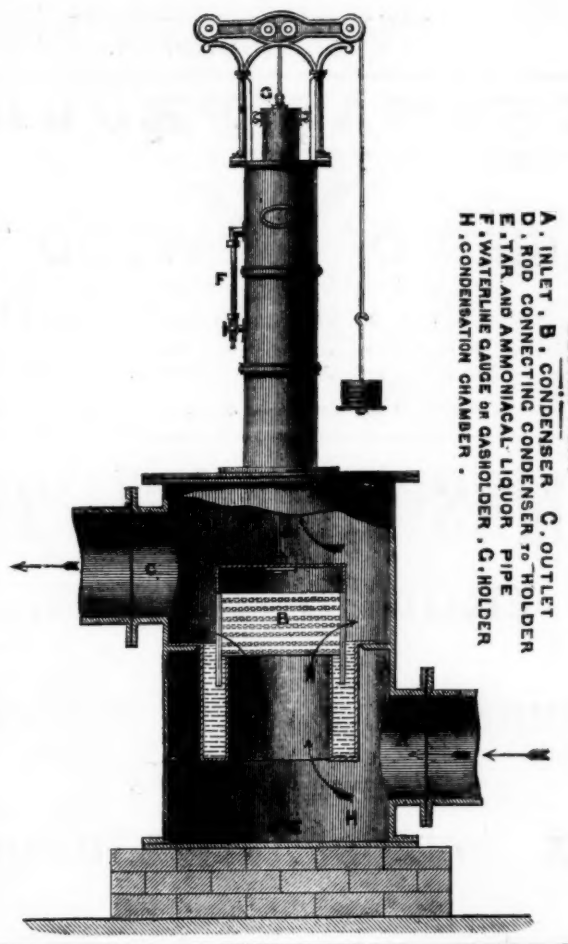
Standard Burner,

"GAS REFEREES MODEL,"

For 14-candle and 16-candle gas, as certified by the Board of Trade, is now ready.

Prices and Description of above will be sent on application.

MESSRS PELOUZE AND AUDOUIN'S
PATENT CONDENSER.


DESCRIPTION.
A. INLET. B. CONDENSER. C. OUTLET
D. ROD CONNECTING CONDENSER TO HOLDER
E. TAR AND AMMONIACAL LIQUOR PIPE
F. WATERLINE GAUGE OF GASHOLDER. G. HOLDER
H. CONDENSATION CHAMBER.

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Jet Photometer

(KIRKHAM & SUGG'S IMPROVED),

Suitable for the English and French systems.

WILLIAM SUGG'S

PATENT

Street-Lamp

METERS

AND

GOVERNORS.

"EVANS"

AND

"LETHEBY"

PHOTOMETERS,

As approved of by the Metropolitan Gas Referees and Standards Department of Board of Trade.

Lists of above will be sent on application.

*** This Condenser is being largely used on the Continent, and is much approved of.

SOLE AGENT FOR ENGLAND,

From whom Prices and all Particulars may be obtained on application,

WILLIAM SUGG,

GAS ENGINEER,

VINCENT WORKS, VINCENT STREET,

WESTMINSTER, S.W.

THE WIGAN COAL & IRON COMPANY,
LIMITED.

DISTRICT OFFICE: 97, NEW STREET, BIRMINGHAM; AGENT: W. M'GOWAN;

Supply the Best Wigan Arley Mine Gas Coal, Gas Nuts, Gas Cannel, &c.

N.B.—The Wigan Coal and Iron Company, Limited, are exclusive owners of the well-known HAIGH HALL AND KIRKLESS HALL GAS COAL COLLIERIES.

GAS PURIFICATION & CHEMICAL Co., LIMITED,

(Successors to JOHN WILLIAM O'NEILL & CO.,)

Offices—PALMERSTON BUILDINGS, OLD BROAD STREET, LONDON, E.C.,

CONTRACTORS FOR GAS PURIFICATION BY OXIDE OF IRON.

The superiority of the material supplied by this Company is generally recognized, and it is now in use in nearly all the London and most of the large Provincial Gas-Works.

JOHN WILLIAM O'NEILL, SAMUEL H. JOHNSON. } Joint Managing Directors.

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BROOKFIELD WORKS, 103, ICKNIELD STREET EAST, BIRMINGHAM,

MANUFACTURER OF V WOOD TROUGHING FOR PROTECTING AND PRESERVING SERVICE-PIPES.

The Wood Troughing being pickled in creosote or gas tar, and the Service-Pipes laid inside the Trough in a bed of gas tar and sand, pitch, or asphalte, the Pipes will last very considerably longer than if laid in the ordinary way.

Made in Large Quantities, to any Length, by Steam Machinery, at Minimum Cost.

THOMAS ALLAN & SONS,

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WORKS:

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Manufacturers of

CAST-IRON GAS AND WATER PIPES.

SIZES: ¾ to 12 inches at GLASGOW.

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A LARGE STOCK KEPT, AND PRICES MODERATE.

Freight to London, in the Stream, 10s. per ton from Stockton; 12s. 6d. from Glasgow.

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IMPROVED DRY GAS-METERS, in Cast-Iron and Tin Cases,

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GAS AND HOT WATER ENGINEERS,

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Manufactory: 19 & 20, NICHOLAS LANE, E.C.

SUN-BURNERS,

With Regulating Valves to obviate down draught.

MEDIÆVAL & OTHER GAS-FITTINGS

For Churches and Domestic Use.

ARCHITECTS' OWN DESIGNS WORKED OUT.

ESTIMATES FREE OF CHARGE.

THE TRADE SUPPLIED.

SOLE CONSIGNEES FOR BRÖNNER'S IMPROVEMENTS IN GAS LIGHTING.

IN THE MATTER OF

BRÖNNER'S GAS-BURNERS.

HENRY GREENE AND SON, 155, Cannon Street, London, Sole Agents for Great Britain, Ireland, and Colonies, of Brönner's Improvements in Gas Lighting, beg to inform the public that on the 13th of January, 1876, Julius Brönner obtained an injunction in the Court of Session, Scotland, against Donald M'Vean, Gas-Fitter, 14, Newton Street, Glasgow, prohibiting him from in any way advertising or offering for sale as Brönner's Burners, any Burner not manufactured by Julius Brönner, or from in any way inducing the public to believe that the said Donald M'Vean sells or keeps for sale Brönner's Burners, manufactured by Julius Brönner, while such is not the case.

Also that on the 9th of November, 1875, he obtained injunction in the same Court, and in the same terms, against R. M. Brechin and Co., 46, North Hanover Street, Edinburgh.

Also that on the 20th of April, 1875, in a suit in Chancery, before Vice-Chancellor Malins, number 1874, B 365, he obtained injunction against another defendant, in the same terms and on similar grounds.

MESSRS. NEWTON, CHAMBERS, & CO.,

THORNCLIFFE IRON-WORKS, NEAR SHEFFIELD,

MANUFACTURERS OF

IMPROVED CENTRE-VALVES,

PURIFIERS, CONDENSERS, SCRUBBERS, GASHOLDERS, ROOFS,

And every description of Gas Machinery.

TENDERS GIVEN FOR WORK FIXED COMPLETE IN ANY PART OF THE KINGDOM.

WEST'S GAS IMPROVEMENT COMPANY,

LIMITED,

ARE NOW PREPARED TO SUPPLY AND ERECT THEIR PATENTED MACHINERY FOR

CHARGING AND DRAWING GAS-RETORTS,

And to enter into arrangements with GAS COMPANIES for its use upon moderate terms of Royalty.

The Patented Machinery has secured the approbation of all Engineers who have visited the MAIDSTONE GAS-WORKS, *where it is in full operation, and may be inspected at any time on application to the Manager.*

The advantages attending its use are—

INCREASED VOLUME OF GAS PER TON.—INCREASED YIELD PER RETORT.—INCREASED BULK OF COKE FOR SALE.—REDUCTION IN LABOUR AND LESS DEPENDENCE ON SKILLED STOKERS.

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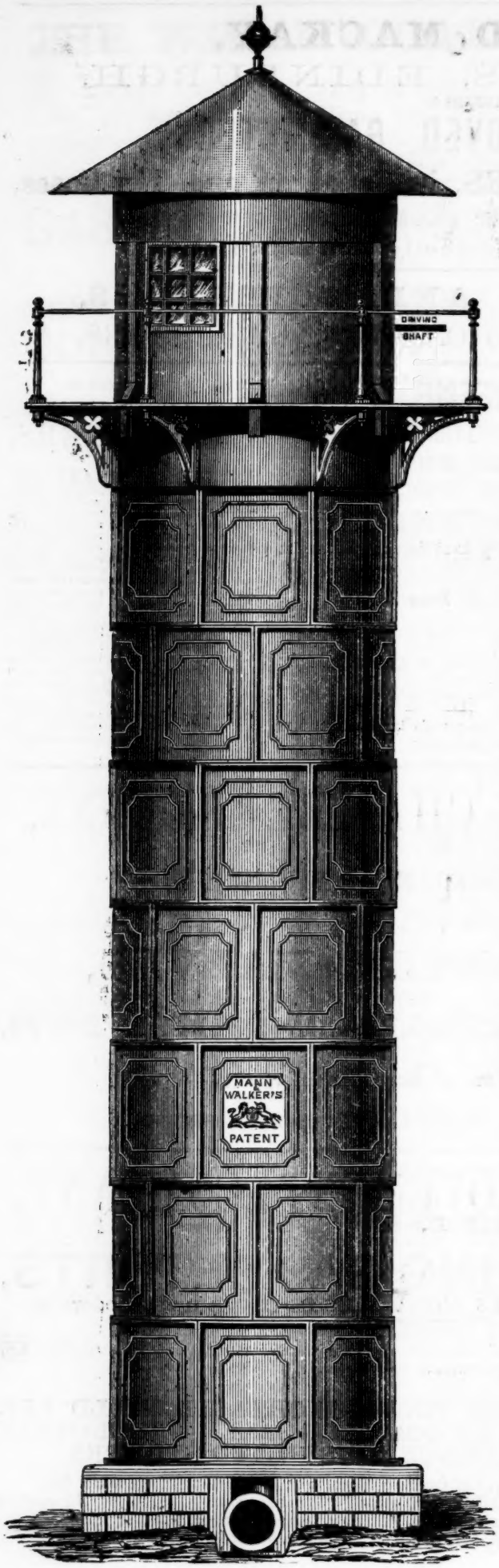

C. & W. WALKER,
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London, E.C.

MANN & WALKERS' PATENT SCRUBBER.

By Letters Patent in Great Britain, Europe, and the United States of America.

By some important improvements recently patented, the purifying power of these Scrubbers has been much increased, and a stronger ammoniacal solution obtained, which is found to absorb a large portion of the carbonic acid contained in gas, effecting an important saving in money and labour in the lime purifiers, and where oxide only is used, the increase in the illuminating power of the gas obtained by these Scrubbers is shown in a remarkable degree, in consequence of the large quantity of carbonic acid removed from the gas.

It is to be particularly noted that the important results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

They are, in all cases, constructed under guarantees to perfectly perform their work. They are now extensively used in the largest gas-works of London and the chief cities of Europe, the number in use exceeds **one hundred,** and their perfect efficiency and profit to a gas company have been fully established with every variety of coal used in Europe. References can be given to the largest gas-works in Europe.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals, generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

They contain their own engine power, requiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

Applications relating to dimensions and prices should be addressed to us, C. and W. Walker, 8, Finsbury Circus, London, E.C., or to Mr. William Mann, late Superintendent of the Chartered Gas-Works, Blackfriars, London; they should state approximately the largest make of gas in 24 hours on a winter's day, and the smallest make on a summer's day, to be purified.

PATENT ANTIMONY PAINT.

MADE ONLY BY

GEORGE HALLETT & CO.,

296, ROTHERHITHE, LONDON, S.E.

This Paint having been in general use over fifteen years (especially in some of the principal Gas-Works), and proved itself the best light-coloured Paint produced for resisting the influence of vitiated atmospheres, it is important that its qualities should be more widely known.

It is not discoloured like white lead in a sulphuretted atmosphere, nor washed off like white zinc; and its light colour reflecting heat, produces much less expansion of gas in holders painted with it than with dark colours, besides rendering them much more sightly. Its specific gravity is so much below white lead that the same weight will cover one-third more surface, while it is equal in body; and its price being about the same (30s. per cwt.), it is actually one-third cheaper. From experience, its manufacture is greatly improved, and it is quite suitable for all purposes in which white lead is employed.

The following Gas Companies in London have used the Paint for years—viz., The Gaslight and Coke, Imperial, Independent, City of London, Commercial, London, and Surrey Consumers.

N.B.—Antimony Paint, COVERING SO MUCH MORE WORK, costs about 20s. per cwt., as compared with White Lead at 30s. per cwt.; a similar economy arises from its use in Steam and Gas Joints, for which purpose it is superior to White Lead.

SPECIAL DRIERS FOR ANTIMONY PAINT SUPPLIED.

JOHN ABBOT AND CO.,

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IMPROVED HYDRAULIC MACHINERY,

Specially Arranged for Lifting and Lowering Purifier-Covers, &c.

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DESIGNS AND ESTIMATES SUPPLIED ON APPLICATION.

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THE DERBYSHIRE

SILKSTONE COAL COMPANY,

LIMITED,

CAN OFFER A

GAS COAL

Of superior quality, delivered at any station in England and Wales.

Purified gas per ton of coal in cubic feet (average)	10,775
Weight of coke in lbs. per ton of coal	1,465

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WENLOCK IRON WHARF, 21 & 22, WHARF ROAD, CITY ROAD, LONDON, N.,
Keep in London and at their works large stocks of PIPES and CONNEXIONS (1½ to 36 inches in diameter); also make and supply Retorts, Tanks, Columns, Girders, Special Castings required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.
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Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.
Warehouse in London for Cast-Iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.
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Of all Dimensions for Gas-Works,
GLASS-HOUSE POTS & CRUCIBLES
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The Highest Award was obtained by H. & M., at the Philadelphia Exhibition, 1876, for Superior Quality of Manufacture.

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PREVENTS WASTE OF GAS FROM RETORTS;
SAVES CLAY RETORTS FROM DESTRUCTION BY FIRE;
GREATLY ECONOMIZES THE USE OF FIRE-BRICKS;
And PREVENTS ALL POSSIBLE LOSS of GAS FROM LEAKAGE.
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18 & 20, ALSTON STREET, GLASGOW.
CAST-IRON GAS AND WATER PIPES.

DELIVERY F.O.B. ON CLYDE, OR STOCKTON-ON-TEES.
Prices on application.

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PATENTEE and MANUFACTURER of the following Inventions:—
RETORT SETTINGS—giving great Economy of Fuel.
STEAM-ENGINES and EXHAUSTERS, FOUR-WAY VALVES.
FUEL-MACHINE, for Compressing Breeze and Tar.
WASHERS, SCRUBBERS, and PURIFIERS, that Economize Space and Cost.
N.B.—Pamphlet, with Eighteen Illustrations of the foregoing, with letterpress on the construction of Gas-Works, post free, 2s. 6d.

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LONDON OFFICES: 1, WESTMINSTER CHAMBERS, S.W.
ESTIMATES FOR GAS-WORKS OF ANY SIZE.
REFERENCES TO 500 WORKS ALREADY ERECTED.
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PUMPING MACHINERY of every Description.
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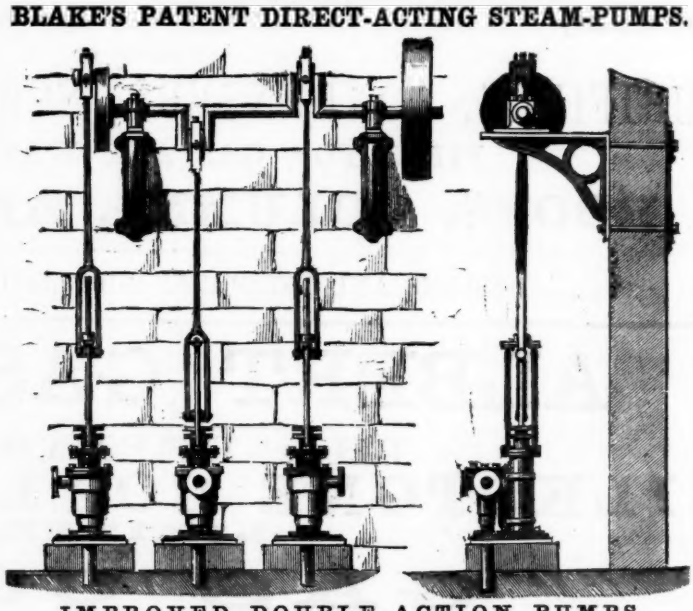

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For Water. For Tar. For Ammoniacal Liquor.
This illustration shows an arrangement of three (No. 179) Improved Double-Action Pumps driven from the same crank-shaft, as frequently supplied for use in Gas and Chemical Works. The suction and discharge pipes can be arranged for drawing from and delivering in any required direction.
These Pumps have been supplied to nearly all the large Gas Companies and Chemical Works, both for Pumping Water, Tar, and Ammoniacal Liquor.
GAS SYPHON PUMPS, IN COPPER OR SHEET IRON, ALWAYS IN STOCK.
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SHOTT'S BOGHEAD.

LOTHIAN'S CANNEL

Yields 12,500 cubic feet of 34-candle gas per ton, and 9 cwts. of excellent coke, containing only 4 per cent. of ash.

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Yields 12,160 cubic feet of 32·5-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash.

OLD WEMYSS CANNEL

Yields 13,320 cubic feet of 32·5-candle gas per ton.

Prices and full Analyses on application.

GAS COAL.

POPE & PEARSON, LIMITED, have now the authority of several of the most eminent Gas Engineers of London in stating that their Coal yields *in practical working over* 10,000 *cubic feet of gas, with an illuminating power of* 16 *candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17½ candles.

One ton yields 12½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.

For further particulars, apply to POPE AND PEARSON, LIMITED, West Riding and Silkstone Collieries, near LEEDS.

PLUTONIC CEMENT,

For Jointing and Repairing Retorts and Ovens both in and out of Action.

Used in the principal London and Provincial Gas-Works as a great aid to the economical production of Gas.

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LESMAHAGOW CANNEL COAL.

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Has on offer, and for immediate delivery, in quantities to suit purchasers, Best Yorkshire, Derbyshire, and North Staffordshire Screened and Unscreened Gas Coals and Nuts; also Best Lancashire, Yorkshire, and other Cannel, as supplied by him to some of the principal Gas Companies in England.

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N.B.—Gas Managers will oblige by advising me when they will be prepared to receive Tenders.

SCOTCH CANNEL COALS.

The Subscriber is prepared to contract for the supply of all the principal SCOTCH CANNEL COALS. Prices and Analyses of the various Coals will be forwarded on application.

JAMES M'KELVIE,

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Established 1840.

HEBBURN MAIN GAS COALS.

T. Stone, Esq., of Weymouth, writes on Nov. 17, 1876: "I have used about 12,000 tons of this Coal, with, I think, the best possible results, although not always under the most favourable circumstances. My Coal account made up to Midsummer last showed a makeage of 10,594 cubic feet per ton of 14½-candle gas, and not a hundredweight of Cannel used. This statement would, I know, be incredible to many men, and may provoke the remark, 'How much of it is paid for?' For the gratification of such, I have to say that, of the above quantity, 9866 cubic feet per ton of Coal carbonized were brought to charge and duly paid for, with the exception of about 6s. per cent. for bad debts. The coke is of excellent quality. The above facts I hold to be a greater recommendation to your Coal than any words of mine could be."

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NEAR NEWCASTLE-UPON-TYNE,

Manufacturer of

CLAY RETORTS, FIRE-BRICKS, AND EVERY DESCRIPTION OF FIRE-CLAY GOODS

WILSON CARTER & PEARSON,

GAS COAL AND CANNEL FACTORS,

Supply to any Railway Station or export Best Wigan Arley Gas Coal and Nuts; best qualities of the Derbyshire, Yorkshire, and North Staffordshire Gas Coals and Nuts; also the best descriptions of Lancashire, Welsh, Scotch, and other Cannel.

MESSRS. WILSON CARTER & PEARSON, being contractors to several of the principal Gas Companies in the Midland Counties, have pleasure in being enabled to give them as references.

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REAL OLD SILKSTONE GAS COAL.

JAMES PATERSON, Esq., Gas Engineer, of the Warrington Gas Company, reported, Aug. 10, 1875:—

"This Coal possesses remarkable qualities as a gas and coking coal, and appears SECOND TO NONE IN THE KINGDOM. It contains the large quantity of 699 lbs. of illuminating matter, and 1498 lbs. of coke to the ton, and produces **12,240** cubic feet of 16·66 candle gas."

The above Company are raising nearly a thousand tons of the Real Old Silkstone Gas Coal per working day.

PRICES QUOTED TO ANY RAILWAY STATION, OR F.O.B. HULL, GRIMSBY, GOOLE, KEADBY, LIVERPOOL, AND FLEETWOOD.

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THORNCLIFFE IRON-WORKS AND COLLIERIES,

NEAR SHEFFIELD,

STRONGLY RECOMMEND A TRIAL OF THEIR

CELEBRATED SILKSTONE GAS NUTS.

Analysis by F. J. EVANS, Esq., Chartered Gas Company, Horseferry Road, Westminster:—

(COPY.)

	Cubic Feet of Gas per Ton of Coal.	Illuminating Power in Candles.	Coke per Ton of Coal used.	Ash in Coke, per Cent.	Sulphur in Coal, per Cent.
Silkstone Nuts . . .	10·800	15·85	12·66 cwt.....	6·0	0·69

NOTE.—The illuminating power of the gas was tested by the standard burner now used in London by the Gas Referees, under the City of London Gas Act, 1868.

Horseferry Road, Westminster, March, 1870. (Signed) F. J. EVANS.

These Nuts are extensively used by various Gas Companies throughout the Kingdom, who bear strong testimony to their value.

APPLICATIONS FOR PRICES, &c., TO BE SENT DIRECT TO THE COLLIERY, AS ABOVE.

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DRY GAS-METERS,

PRIZE MEDALS.
LONDON, 1851;
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PARIS, 1855.

(INVENTED & PATENTED IN 1844,)

COMBINING ALL THE LATEST IMPROVEMENTS,

MANUFACTURED ONLY BY

PRIZE MEDALS.
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HARRIS & PEARSON,
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A LARGE ASSORTMENT OF GAS-RETORTS IN STOCK.

STOCK FOR EXPORT READY AT THE WORKS, AND AT ELLESMERE PORT.

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RECESSED CONE CENTRE-VALVES,

Constructed on the principle of the ordinary Plug-Cock.

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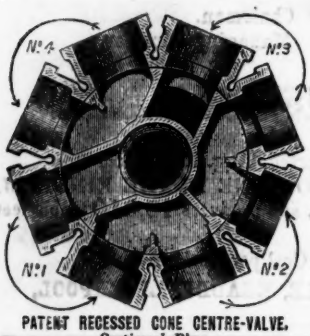
Of all descriptions.



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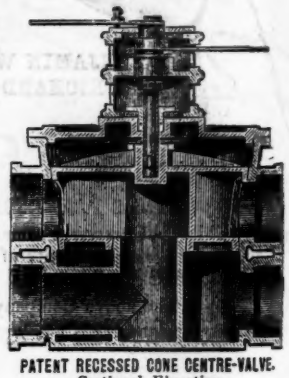
Sectional Plan.



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Sectional Elevation.

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Invite the attention of Gas Companies, Corporations, and others to their

PATENT STREET LAMPS,

Which are so constructed that neither putty nor other materials are required to secure the glass. No hacking out of old putty, which frequently destroys the frames. A new pane of glass can be inserted in two or three minutes by any inexperienced person, the glass being secured by a hinged flap and turn button.

PRICE 10s. each, net. Special quotations for large quantities.
Also made EXTRA STOUT recommended for its durability, PRICE 11s. 6d. each.

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By the use of which stoppages in service and other pipes are freed from naphthaline and other obstructions in a few minutes. PRICE 73s. net.

HULETT'S PATENT MERCURIAL REGULATOR,

For inserting in mains, to prevent the excess of pressure in high ground, or other elevated positions.

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Makers of all kinds of Pressure-Gauges, Gaseliers, and every kind of Gas-Fittings for the Trade.

GAS HEATING AND COOKING STOVES.

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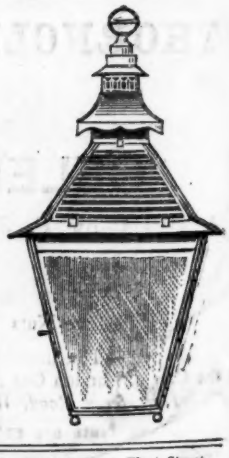

London: Printed by WILLIAM BOUGHTON KING (at the office of Clayton and Co. 17, Bouverie Street, Fleet Street); and published by him at No. 11, Bolt Court, Fleet Street, in the City of London.—Tuesday, April 24, 1877.